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THE METROPOLITAN DEBTS

OF

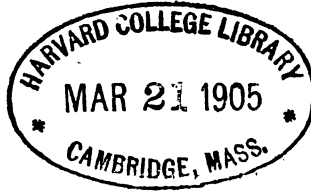
BOSTON AND VICINITY

SINKING FUND AND SERIAL BOND METHODS COMPARED

PROPOSED LEGISLATION

BY ALFRED D. CHANDLER, Esq.

BROOKLINE, MASS. :
PRINTED UNDER A VOTE OF THE TOWN,
JANUARY, 1905.



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At the Annual Town Meeting in Brookline, Mass., held in March, 1904, a committee was appointed to examine into and report on the subject, —

“To see what action the town will take to improve its financial relations with the State and Metropolitan District.”

This committee, consisting of Joseph Walker, James M. Codman, Jr., Alfred D. Chandler, James R. Dunbar and Frederick P. Fish, presented its report in print at the town meeting, December 28th, 1904, and the following votes were passed by the town : —

Voted, That the report of the committee be accepted and that the committee be requested to confer with officers of the Commonwealth and officers and citizens of other municipalities and to co-operate with them in getting the recommendations of the report carried out.

Voted, That the Selectmen be authorized and instructed to appear before the General Court of 1905, to secure the passage of an act to authorize towns and cities to pay certain Metropolitan debts, substantially in the form of the act therefor submitted at this town meeting by the committee appointed under the twenty-eighth article of the warrant for the annual town meeting in Brookline of March 16th, 1904.

In support of these votes the committee have caused to be printed the following pages prepared by Alfred D. Chandler, on Metropolitan Debts, comparing Massachusetts Sinking Fund and Serial Bond methods of extinguishing public debts, together with tabular proofs, a proposed Act for the relief of municipalities in the Metropolitan District, and other pertinent information. At Mr. Chandler's request, the computations presented in typewritten form by him to the committee and herein printed, were submitted to and were approved by a public accountant, before this pamphlet was allowed to go to press.

Brookline, Mass., January 20, 1905.

THE METROPOLITAN DEBTS.

That part of Massachusetts within about twelve miles of Boston, and included in the Metropolitan District, is liable for heavy Metropolitan debts, beyond its municipal debts, and beyond its proportion of the State "direct" debt, of which it pays about 60 per cent. The Metropolitan debts in Massachusetts far exceed the entire debt of any other State in the Union.*

There are forty towns and cities within the Metropolitan District. They are held to pay about \$65,000,000, gross, of principal, for Metropolitan liabilities, the interest on which is (less premiums) about \$80,000,000, a total Metropolitan obligation of about \$145,000,000. In addition to this are their municipal debts, of about \$129,000,000, gross, exclusive of interest; and about 60 per cent of the State "direct" debt, or about \$18,000,000, exclusive of interest. There is also their proportionate share of the County debts of Essex, Middlesex, Suffolk, Norfolk and Plymouth Counties, — a grand total of liability, with interest, of about \$400,000,000, gross, on about 400 square miles of territory, or about one-twentieth the area of the State.†

The Metropolitan sewerage, park and water obligations are issued "in the name and behalf of the Commonwealth and under its seal," and are "deemed a pledge of the faith and credit of the Commonwealth," thus creating a State debt; but the State is empowered, through the Supreme Judicial Court, to

*A table of the debts of the 45 States is given in the Appendix, p. 34.

	Debts.	Sinking Funds.	Net Debts.
† State "direct" debt, Dec. 31, 1904,	\$30,800,750	\$15,233,154	\$15,576,595
State "contingent" debt, Dec. 31, 1904,	64,989,412	6,230,877	58,758,535
Totals,	\$95,799,162	\$21,464,031	\$74,335,130
Municipal debts of the 40 towns and cities			
in Metropolitan District, May 1, 1904,	129,017,243	37,813,786	91,203,457
Totals,	\$224,816,405	\$59,277,817	\$165,538,587

collect from the municipalities directly involved, such apportioned annual contributions as will pay that debt. (Acts of 1889, ch. 439; 1893, ch. 407; 1895, ch. 488.)

At no time in its history, up to the period of the Civil War, was the principal of the public debt of the United States as great as that of the Metropolitan District of Boston and vicinity today. In 1816, after the war with Great Britain, the debt of the United States was \$127,000,000; in 1836 Congress passed an act to distribute among the States a surplus of about \$37,500,000; and on July 1, 1861, the national debt was only about \$90,000,000.

It is said that in the United States the aggregate of municipal debts now rivals the national debt in magnitude.* The problem of obtaining revenue for local debts, is a more complex and difficult one than that for the national debt. This disparity has in recent years become so serious as to demand a readjustment of the sources of public revenue.

The Nation has means of revenue which the States and municipalities have not. The Nation's income from internal revenue, customs, profits on coinage, sales of public lands, postal charges, letters patent, and from other sources is very large, and can be made as elastic and responsive as war or other exigencies at any time demand.

But for the States, and for their municipalities, the revenue question is more perplexing; and of these two the needs of the States are relatively small as compared with those of local governments. There is no system in the distribution of revenue sources between the two forms of government.

While the United States has not repudiated its debt, yet when in London, in 1839, Daniel Webster was asked by the Baring Brothers & Co., for his opinion on the power of a *State* legislature to contract loans, which Mr. Webster answered in the affirmative, incautiously adding, and what afterwards became embarrassing, from the publicity the opinion received, that —

*New Internat. Cyc. Vol. V. p. 711. The returns upon this of the National Census of 1900 are not yet published.

"The States cannot rid themselves of their obligation otherwise than by the honest payment of the debt . . . Any failure to fulfil its undertakings would be an open violation of public faith, to be followed by the penalty of dishonor and disgrace: a penalty, it may be presumed, which no State of the American Union would be likely to incur." (Webster's Works, Vol. XII, pp. 211, 214.)

In an elaborate article on the "Debts of the States," first published in 1844, the late Hon. B. R. Curtis wrote that —

"Our foreign commercial debt had been paid with so much promptness, that European capitalists formed a very high opinion both of our resources and our honor, and they took the stocks of the States as freely as if they had been gold and silver." (*Life*, Vol. II., p. 106.)

Repudiation by States in this country rapidly followed. Nine out of twenty-six States in existence when Mr. Webster gave that opinion, dishonored their undertakings. In all sixteen* out of the forty-five States have repudiated or scaled down their debts, or defaulted in interest, including both northern and southern States, and before as well as since the Civil War, such debts involving, as reported, with accumulated interest, about *three hundred millions* of dollars! (No. Amer. Rev., Aug. 1884, p. 128.)

The extent of repudiation of *county* and *municipal* debts in the United States, in addition to State debts, is not known, but has been estimated to be about *one billion* of dollars.†

*Pennsylvania, Maryland, Virginia, North Carolina, South Carolina, Georgia, Florida, Alabama, Mississippi, Louisiana, Arkansas, Tennessee, Indiana, Illinois, Michigan and Minnesota.

When the State of Pennsylvania in 1842, defaulted in its interest, the Rev. Sydney Smith declared he felt inclined, if he met a Pennsylvanian at dinner, to strip him of his clothes and boots for division among the guests, most of whom had probably suffered by his State's dishonor!

†The most prolific field for municipal delinquencies has been in and near the naturally rich Mississippi valley, from Duluth to Mobile, including Keokuk, Quincy, Cairo, St. Joseph, Leavenworth, Lawrence, Topeka, Little Rock, Memphis, New Orleans, Shreveport, Houston, etc., etc. Of over three hundred municipalities in Illinois, more than one-third refused payment of bonds. Of one hundred counties, townships and cities issuing bonds in Missouri, nine-tenths have defaulted. Kansas' record is somewhat better, but humiliating; while the bonded communities of Arkansas have been unanimous in attempting repudiation. Such municipalities also may be found within sight of the steeples of New York City. (From No. Amer. Rev. of Aug. 1884, pp. 127-144 and 563-579, wherein is a revelation of such wholesale evasive stratagem and bold defiance of law and morality, that it mocks Daniel Webster, and suggests toleration for Santo Domingo and certain Latin-American Countries.)

The gross indebtedness of the Metropolitan District of Boston and vicinity, covering an area of only 400 square miles, and a population of about 1,200,000, is now about what the indebtedness of the whole number of States, with a population of about 17,000,000, was in 1842, when repudiation was rampant, — that is, about \$200,000,000, exclusive of interest, which will equal the principal.

The "States are practically free to pay their debts, or to repudiate them as they see fit." (Repudiation of State Debts, Scott, p. 30 ; 127 Mass. 43, 46.) But in Massachusetts the creditor has a remedy against any defaulting municipality. Hence, on that account, and because the sources of public revenue available to municipalities are the most limited of the three divisions of government, — the Nation, the State, and the municipality, — the financial problem confronting Boston and its vicinity can hardly be overrated in importance. Any practical suggestion to ameliorate the situation deserves attention, and adoption if sound.

Brookline's municipal debt is about \$1,500,000 of principal ; its share of the principal of the Metropolitan debts (Parks and Sewerage) is about \$2,100,000 ; a total indebtedness of about \$3,600,000, exclusive of interest, and exclusive of its share of the State "direct" debt, Brookline being the fourth largest contributor to the State tax, the order being Boston, Worcester, Cambridge, Brookline.

Massachusetts authorizes two ways of borrowing money, on long time, for public uses. One is the Sinking Fund method, intended (as operated in Massachusetts) to pay the principal at its maturity, but not to pay the interest, which is often far greater than the principal, and which must be paid by taxation. The other way is by Serial Bonds, the principal of which is paid by taxation in equal annual instalments ; the interest, which annually *decreases*, is also paid by taxation.

Massachusetts arbitrarily applies the Sinking Fund method to the Metropolitan Debts. For those debts the State refuses

to the municipalities in the Metropolitan District the benefit of Serial Bonds, although the State, by Chapter 133 of the Acts of 1882, expressly authorized Serial Bonds as an advisable mode of financing public debts, and many municipalities adopt that mode.

The difference in interest, in cost, and in risk, on long time bonds, between these two fiscal methods is very great, where large amounts are involved. When the total State debt, as in the case of Massachusetts, reaches National proportions, — about \$95,000,000 of principal, with Sinking Funds to invest and reinvest to the amount of about \$21,000,000, and when the additional municipal debts of the Metropolitan District are about \$129,000,000 of principal, with sinking funds of about \$37,000,000, — the fact that neither the State, nor the Metropolitan District, nor any of its municipalities, has the revenue resources of a Nation, emphasizes the significance of the operation of these two ways of borrowing money for public uses.

Brookline, to its great advantage, long since abandoned the Sinking Fund method, as a financial anachronism for its municipal loans, as out of date, unreliable, too costly, and to be discarded in advanced municipal finance. Since 1886, Brookline has adopted the Serial Bond method; in that way it has successfully placed fifty-eight loans,* covering about \$3,606,000, at an average rate of about $3\frac{1}{2}$ per cent, at an average time of about fifteen years, and a difference of about \$880,000 in interest.†

Two objections to the Serial Bond method are often advanced, but have long since been disposed of: — unpopularity and a high rate of interest. When Brookline first con-

* Given in full in the Appendix, pp. 37, 38.

† This, of course, does not mean that amount of *saving*. The Brookline loans were mostly on quite short time. None were forty year loans, as are the Metropolitan debts. Between the two methods, large savings do not come on short time but on long time Serial bonds for large amounts, as will be demonstrated later on for Brookline's case, Boston's case, and that of the Metropolitan District at large (pp. 20 to 27). An aggregate of fifty-eight Sinking fund accounts, many comparatively petty, was wisely avoided by Brookline. Expense lurks in a prolonged interest account which taxation must meet annually, and which must also meet any final deficiency in the sinking fund. (Rev. Laws, Ch. 27, Sect. 12.) For details of the progressive *savings*, between the two methods, when applied, for example, to bonds for \$1,000,000, for 20, 40 and 50 years, on a 3 and on a 4 per cent basis, see Appendix p. 73 *et seq.*

sidered the adoption of Serial Bonds, influences were brought to bear to prevent the first town in New England from confirming the municipal wisdom of that course. The opposition was ineffectual. The advantages of Serial Bonds, to both lender and borrower, are now recognized throughout the country, and are applied to loans of many millions of dollars for industrial as well as for municipal bond issues. The money market is now too broad, elastic and responsive, to be cramped by the narrower view of the last century.

As far back as 1886, Brookline's first Serial Bond loan of \$100,000 was placed without difficulty at 3 65-100 per cent, notwithstanding warnings of failure. A list of Brookline's Serial Bond loans is given in the Appendix, as a convincing answer to the usual objections to that method. Among other Massachusetts municipalities that have adopted Serial Bond issues the following twenty-two are noticed: Arlington, Boston, Fall River, Fitchburg, Gardner, Gloucester, Hingham, Holyoke, Lawrence, Lowell, New Bedford, Newton, North Adams, Northampton, Peabody, Quincy, Rockport, Salem, Somerville, Springfield, Sunderland, and Winchester.

The difference to Brookline in the *interest* account of its loans since 1886, by the Serial Bond method, is about \$880,000 over the Sinking Fund method. How far the successful operation of numerous Sinking Funds would have counterbalanced the greater part of that difference is so problematical, and, judging from Brookline's former experience with Sinking Funds, so sure of failure, that neither creditor nor debtor should wish now to relapse to the Sinking Fund method.

Few tax payers are aware of the contrast between these two methods. The difference in the interest account is enormous, and it is against the Sinking Fund method. The Sinking Fund, which is supposed to earn enough to meet the principal of the debt, but not the interest, is subject to constant risks. Sinking Funds are often neglected, mismanaged, lost, appro-

priated to other uses, and have been stolen.* State Constitutions and State Laws to maintain the inviolability of Sinking Funds, are found to be inadequate to protect either creditor or debtor. The suspension of a Sinking Fund is at times deliberate, and is essential in sound finance if money must be borrowed to maintain it; for to borrow to keep up the Sinking Fund is a purely fictitious operation, which really adds to the debt it in no wise reduces. England suspended the Sinking Fund in 1886-7, after the war in Egypt, and again more recently on account of the Transvaal war, reliance being placed upon the Nation's credit for the final liquidation of these debts.† In England it is affirmed that few highly educated men turn their attention to finance, unless compelled by the necessities of politics (*Sinking Funds*. Sargent. London. 1868, p. 19); and from England come astonishing revelations, proved as late as 1869 by a Parliamentary committee, to the effect that:—

“Estimated as a net result of the Sinking Fund system kept up during war, the nation had between 1785 and 1829, borrowed £330,000,000 at about 5 per cent interest, in order to pay a debt of the same magnitude at $4\frac{1}{2}$ per cent interest. This policy, by which a debt at $4\frac{1}{2}$ per cent was converted into one at 5 per cent, meant an annual loss of interest of £1,627,765 extending over forty-three years.” (Equal to a total loss of £69,993,895, or \$338,770,427.) (*Sinking Funds*, Ross, pp. 17, 18. *Cyclop. of Polit. Science*, III., p. 720.)

* There was a fraudulent misappropriation and loss of between \$80,000 and \$90,000 connected with the Boston Sinking Funds, about the year 1880. (Auditor's Rep. City of Boston, 1880-81, p. 7.) Ex-Alderman Tinkham of Boston, a close student of the city's finances, affirms that recently “money (\$292,000) has been taken from the Sinking Fund for current expenses in an exceptional way.” (Boston Transcript, Aug. 15, 1904.) It is reported that in Chicago the city's Sinking Funds have been generally taken for current expenses. The sinking fund begun in Mississippi, in 1832, on a \$250,000 premium for its bonds, grew by 1839 to \$800,000, and then shrank from bad investments to \$100,000 in 1848. The most frequent reason for receiverships for railway companies, is the failure to pay the interest on mortgage bonds. During twenty-five years, up to 1898, more than 700 railroad companies, with a mileage exceeding 100,000 miles, representing about \$3,000,000,000, in capital stock and bonded indebtedness, were put into receiverships, much of it notwithstanding the common practice of creating sinking funds. Modern industrial, especially in the West, are now adopting serial bond issues as a better guaranty of staying commercial power.

† *Trinquat*, “*De L'Amortissement des Emprunts D'Etats*,” Paris, 1899, p. 388.
Raffalovich, *Review of the world's financial affairs*.
Journal des Economistes, January, 1903.
Journal of Commerce and Commercial Bulletin. New York, Feb'y 3, 1903.
Sinking Funds, Ross. American Economic Association, pp. 92, 103.

During our civil war the United States did not make that mistake,* for although the Act of 1862, authorizing legal-tender notes, provided for a Sinking Fund of 1 per cent, yet —

“During the war no attempt was made to fulfil this pledge, as the government was continually borrowing and adding to its total indebtedness.” (*Financial Hist. of the U. S.*, Dewey, p. 356.)

Or, as stated by John Sherman : —

“While the United States was borrowing large sums and issuing bonds, it was folly to pay outstanding bonds, and this was not done until 1868, when the treasury was receiving more money than it disbursed.” (*Sherman's Autobiography*, Vol. II., p. 876.)

Although our metropolitan and municipal debts have attained National proportions, and far exceed that of any State in the Union, yet but little aid can be drawn from the experience of our Nation with its sinking funds, because soon after the civil war the Nation's receipts so far exceeded its expenditures, that the National debt was paid off much more rapidly than the sinking fund required, and John Sherman writes that : —

“The term ‘Sinking Fund,’ as applied to *National* accounts, is a misleading phrase. It is a mere statement of the reduction or increase of the public debt, showing whether we have or have not paid one per centum of the public debt each year. *There is no actual fund of the kind in existence for national purposes.*” (*Sherman's Autobiography*, Vol. II., p. 877.)

The requirements of the National Sinking Fund Act of February 25, 1862, were not complied with, because the National expenses during the war exceeded the revenue ; but after the war the debt began to be paid faster than the Sinking Fund requirements called for ; thus between 1862 and 1876 the Sinking Fund called for \$483,848,215.37, but by June 30, 1876, the reduction of debt was \$656,992,226.44 or \$223,144,011.07 more than was absolutely required. (*Public Debts*, Henry C. Adams, pp. 272, 273.)

* But the City of Boston, according to Ex-Alderman Tinkham, has recently (1904) committed this fundamental error, for, as he writes : “This year bonds have been issued to the amount of \$552,670 to pay the interest and sinking fund charges of the highway debt.” (“The City's Finances.” Transcript, Aug. 15, 1904.)

Neither Massachusetts, nor the Metropolitan District, nor any municipality in that district, has any such sources of revenue, or powers of taxation, as the United States; hence the mode of financing the relatively enormous debt resting upon that District becomes a more serious matter than it would be for the Nation; and the necessity of examining this State's arbitrary Sinking Fund method of handling the Metropolitan debts, in contrast to the optional and safer Serial Bond mode allowed for financing municipal debts, is imperative.

In England the successive failures of Sinking Funds, it is said, "made the term Sinking Fund almost one of reproach." (*Sinking Funds. Sargant*, London, 1868, p. 82.)

"In 1816 a Sinking Fund was commenced in France, on the principle of Mr. Pitt's English one. It has long since ceased to produce any effect but that of creating confusion in the accounts." (*Idem*, p. 131.)

"In time of peace, it (the Sinking Fund) has no efficacy beyond that which would result from applying the surplus revenue to an equal amount in the redemption of the debt; and in time of war, when more debt is contracted than is paid off, it ceases to have any efficacy whatever, and only serves to increase the burdens of the people when they are least able to bear them, not only by the expense attending 1 per cent of taxes raised, but by the expense attending the execution of the plan." (*Edinburgh Review*, January, 1823, "*Errors in our Funding System*," pp. 1, 11, 12.)

It is true that, as late as 1875, England at last adopted the improved American Sinking Fund system, originating in 1802 with Albert Gallatin, our Secretary of the Treasury a century ago, yet England has already found it necessary to suspend its Sinking Fund in 1886-7, and in 1903, and modern authority affirms that, —

"Whenever the financial condition of a nation warrants a repayment of debt there are simpler methods of proceeding than sinking fund arrangements . . . while it (a sinking fund) has been discarded in the practice of the more advanced nations, it is sometimes used by the nations of weaker credit." (*Finance. The New Internat. Encyc.* Vol. III. pp. 382, 383.)

The late Professor Dunbar, of Harvard University, in his *Economic Essays* (p. 84, *et seq.* Ed. of 1904), referring to Mr. Pitt's famous Sinking Fund system which was swamped by the

gigantic wars of the French Revolution, affirms that it rested "upon a complete illusion as to the possibility of holding Parliament permanently to the system — as to the possibility, that is, of binding the debtor by a compact made with himself." On the other hand Alexander Hamilton, following Pitt, hoped for an adequate surplus revenue, to sustain his system, which "was made useless by the astonishing growth of national revenue." (*Idem*, p. 89.) So after our Civil War, the wonderful prosiliency of the Nation swept aside the Sinking Fund requirements of the Congressional Act of 1862, reducing them to a mere perfunctory book-keeping entry.

M. Trinquat, in his *De L'Amortissement des Emprunts D'Etats*, published in Paris, in 1899, wherein is a bibliography of the literature on Sinking Funds, including ninety-six works in different languages, concludes that Finance should be so simple as to be easily understood by all classes, and that the easier it is the nearer it is to perfection (p. 381).* He agrees with the eminent political economist J. B. Say in that there are no two ways of extinguishing debt; the *only way* is, for a State as for an individual, to use the revenue above the expenses. Every other form of extinguishing a debt is a pure folly, wherefrom no advantage accrues to the State (p. 385). His opening chapters aim to show that morally, politically and economically amortization [extinction rather than conversion] of public debts is a necessity. He maintains that for the public to free itself from the obligation of paying debts is to encourage itself to incur infinitely new debts (p. 78); and he quotes Ricardo, that Sinking Funds rather tend to encourage expenditure, than to diminish debt (p. 209).

A Sinking Fund — its objectors allege — "acts on the public as a narcotic," for "the confidence placed in the efficacy of these schemes has contributed further to ease the alarm which

*The voluminous literature on Sinking Funds fully reveals the theories, history and operation of that mode of extinguishing debts in Europe and America. With the aid of the Robinsonian Bond and Investment Tables, published by J. Watts Robinson, of Brookline, the application of Sinking Funds to loans can be figured easily. The test of the application to Brookline and the Metropolitan debt, appears later in this report.

the magnitude of the public debt would otherwise have produced." (*Sinking Funds*, Sargent, p. 170.)

There are fallacies in the management of Sinking Funds that have long since been exploded, but which are still overlooked or disregarded in this country. However sound in theory a Sinking Fund may be, it is the *mode of investment, its administration*, which is the vital point. The English Sinking Fund proved abortive because, in part, its Commissioners were required to buy government stocks.

"The chief and central misconception was in regarding government stocks as *productive* property. It was this that led to looking upon the interest on stocks bought in for the sinking fund as 'earnings,' and not as the proceeds of taxation." (*Sinking Funds*, Ross, p. 13.)

"That cannot be regarded as a productive property, to the government which rests upon taxes levied and collected by the government. It is the taxes that are the sources of revenue and not the fund." (*Public Debts*, Henry C. Adams, 1898, pp. 253, 254.)

But even here in Massachusetts, this fallacy that has wrecked Sinking Funds, and has been so long exposed, appears to be perpetuated by Legislative Acts. Some instances of such Acts authorizing Massachusetts municipalities to invest their sinking funds in their own loans, or government stocks, are:—

Acts 1885, Chap. 377, Sec. 5; under which \$850,000 of the City of Boston's bonds were taken for investment by the Boston Sinking Fund Commissioners.

Acts 1895, Chap. 36. Brockton, \$250,000 sewer loan. Sinking fund of any loan of the city may be invested therein.

Acts 1896, Chap. 207. Brockton, \$50,000 drainage loan. Sinking fund of any loan of the city may be invested therein.

Acts 1898, Chap. 478. Marlborough, \$50,000 water loan. Sinking fund of any loan of the city may be invested therein.

Acts 1901, Chap. 75. Brockton, \$100,000 sewer loan. Sinking fund of any loan of the city may be invested therein.

And see *Revised Laws*, Chap. 27, Sec. 15.

The pamphlet on "*The Sinking Fund*" by George Morgan Browne, Esq., of Boston, and which reached a second edition in 1880, clearly condenses the reasons for avoiding Sinking Funds in large fiscal operations, and is from the pen of a practical man at one time President of the Eastern Railroad.

Mr. Browne objects to the Sinking Fund : —

1. Because the Sinking Fund is seldom placed, in practice, beyond the debtor's control, or, in the case of corporations, municipal or private, beyond the reach of their general creditors ; so seldom, indeed, that such cases form the exceptions to the usual course of proceeding.

2. The creditor's legal rights are very little, if at all, strengthened by a sinking fund invested in outside securities, so long as they remain under the control of the debtor himself, or within reach of his general creditors.

3. If the Sinking Fund is invested in the debtor's own bonds or obligations, its existence is *not of the least advantage to the creditor*. It gives him no additional security, — legal, equitable, or honorary. It is a worthless device so far as he is concerned. (*The Sinking Fund, Browne, 2d ed., pp. 17, 18, 19.*)

"To the *creditor*, then, the Sinking Fund, in most cases is of no value ; it is never of any value whatever, except in the rare instances in which it is placed absolutely beyond the control of the debtor, and out of the reach of his general creditors. If anybody, therefore, invests money in the bonds of a corporation, municipal or private, relying on such a Sinking Fund so remaining within the debtor's power, his investment rests, so far, on a basis wholly shadowy and deceptive. If the debtor is able to pay the original debt, well and good ; but the Sinking Fund gives no additional guaranty ; it adds nothing to the security."

"To the *debtor*, however, the Sinking Fund is always an expense, — often a snare and a delusion. If it tempts him, if it leads any city, town or State to contract unnecessary or not indispensable debt, under the futile hope that through wonder-working accumulation, that debt is to be extinguished without the hardships of taxation and self-denial ; without in short, raising the last dollar of the loan with interest in one form or another, then the Sinking Fund is more than an empty delusion ; then it inflicts on persons and communities, for the present and the future, great and positive injury and loss." (*The Sinking Fund, Browne, 2d ed., p. 19.*)

"The best way to sink a debt is to pay it ; the surest sinking fund is *payment*." (*Idem, p. 10.*)

Some of the evils attendant upon the sale by a city of its bonds to itself for its sinking fund, and the reasons for the refusal of the Court to allow it, are given in the opinion of the

Chief Justice of Minnesota in the case of *Kelly vs. Minneapolis*, (Lawyers' Reports Annotated, Vol. 30, pp. 281, 283,) to the effect, in brief, that the board of Sinking Fund Commissioners cannot purchase from the city its bonds, although no statute forbids it, because "such a purchase is so radically inconsistent with the essential character of the sinking fund, and so destructive of the purposes to be conserved by its maintenance, that it must be held that the prohibition is implied."

... "To construe the law so as to authorize such a sale would make the sinking fund a *debt-creating* instead of a debt-paying scheme." It would, as the Court holds, permit a city to market its bonds to itself, when the credit of the city or the state of the money market might be such that the bonds would not sell outside, which the Court regards as a diversion of the sinking fund to the prejudice of the city. It would enable one branch of the city officers to play into the hands of another to create municipal debts. There was no claim of want of good faith in this Minneapolis case; but the Court affirmed that the evils which might result from permitting this to be done are serious, and that it must guard against the possibility of such evils.

One phase of the insecurity of sinking funds for both creditors and debtors appears in the Constitution of Pennsylvania, adopted in 1873, Art. IX., Sec. 11, to the effect that no part of the State Sinking Fund shall be used otherwise than to extinguish the public debt, "unless in case of war, invasion, or insurrection;" which implies that creditors may then see their security swept away; and that debtors will have to make good the loss by taxation.*

* Many believe that Pitt's Sinking Fund became valueless by the subsequent practice of making loans to the Government out of the Sinking Fund. This arose at first from Fox's proposal, acceded to, however, by Pitt. Fox's great objection to the Sinking Fund was its inalienability under any circumstances, and he introduced a clause to authorize its use for a Government loan if occasion required. Thus if six millions were wanted and a million could be had from the Sinking Fund commissioners, "a great benefit would arise to the public." Peace was essential to carry out Pitt's Sinking Fund. Seven years after his fund began, he was dragged into a war with France, accompanied by stoppage of the Bank of England, French revolutionary successes, and a war delirium in England. (Sargant, Sinking Funds, pp. 48, 54, 56, 96, 100, 102.)

Pennsylvania's gross debt, Dec. 1, 1903, was about \$4,700,000 ; Massachusetts' gross debt was then about \$91,000,000 ; the greater part of which, or about \$61,000,000, devolved upon our Metropolitan District ; a debt about thirteen times that of the State of Pennsylvania.

Pennsylvania, however, recognizes the Serial Bond principle of payment, in its Constitution, which provides that a sum of not less than \$250,000 shall *annually* be applied from the sinking fund to reduce the principal of the debt.

West Virginia, by its Constitution of 1872, Art. X., Sec. 4, expressly provides for payments of the debt as under the Serial Bond method as follows : "The payment of any liability, other than that for the ordinary expenses of the State, shall be *equally distributed* over a period of at least twenty years."*

Two kinds of Sinking Funds are noticed in our Courts : a real Sinking Fund, and a pseudo Sinking Fund. The first is intended to ultimately extinguish a certain indebtedness ; the second is intended to allure purchasers of bonds by holding out a security that is such in appearance only and not in reality.

This report excludes from consideration Sinking Funds of the second or fraudulent kind, and is confined to a practical application in the Metropolitan District of State Sinking Funds based upon integrity, but subject yet, for several decades, to political vicissitudes and control.

That the State itself, for nearly a quarter of a century, has appreciated the risks and the expense of even well intended Sinking Funds, appears in Chapter 133 of the Acts of 1882, now incorporated in the Massachusetts Revised Laws, Chapter 27, Sec. 13, which expressly provides that any town or city in Massachusetts —

* The action taken by the State of Maine, in discontinuing its Sinking Fund may be followed in the Inaugural Addresses of its Governors, in the Maine Acts and Resolves for : 1875, p. 64 ; 1876, p. 148 ; 1877, p. 239 ; 1878, p. 51 ; 1879, p. 120 ; 1880, p. 213 ; 1887, p. 73 ; 1889, p. 137 ; 1891, p. 133. Also, Acts and Resolves of Maine, under Resolves, for 1863, chs. 203, 276 ; 1864, ch. 318 ; 1875, ch. 48 ; 1878, ch. 56 ; 1889, ch. 308. Also Reports of Treasurer of Maine, for corresponding years.

“instead of establishing a sinking fund, may vote to provide for the payment of any debt by such annual proportionate payments as will extinguish the same at maturity.”

This Massachusetts law is a recognition of the importance and safety both to creditors and to debtors of the Serial Bond method of paying public debts by annual proportionate payments. Experience now proves that the advantage of Serial Bonds cannot be questioned in Massachusetts.

But the State, in contradiction to this, has imposed a liability of about *sixty-five millions* of dollars upon 40 of its towns and cities composing the Metropolitan District, out of 353 municipalities in the State, and has refused to those 40 towns and cities the benefit of the Serial Bond law for that liability, although that law can still be applied to their *municipal* debts.

The State, when its attention was called recently to the extent of this inconsistency, enacted a law, (Acts of 1903, Chap. 226,) applying the principle of Serial Bond issues to *future State Loans*, but then emasculated the Act, so far as it relates to the Metropolitan District, by the following clause, which denies relief to the very part of the State the most in need of it:—

“Sec. 3. The provisions of this Act shall not apply to any issue of bonds or scrip now or hereafter authorized for the benefit of any of the Metropolitan District, so called.”

That is to say, the Metropolitan District, which contains nearly two-thirds of the assessed valuation of the State, is hereafter to be discriminated against in favor of the remaining one-third in valuation, besides bearing a sixty-five million dollars liability financed and controlled by the State in an unnecessarily costly way.

It is to meet this unsatisfactory situation that a proposed Act of the Legislature is herewith submitted, which gives to any of the towns and cities in the Metropolitan District the option of availing of the Serial Bond method of financing its respective share of the Metropolitan debts, and in a way so simple as to strengthen the position of both creditor and debtor, without impairing any obligation, or the interests of any other municipality.

The significance of the operation of such an act may be summarized for the entire District, by presenting herewith one of the tabular statements drawn to the attention of the State Treasurer, prior to the Act of 1903, Chap. 226, above referred to, showing that the difference in the *interest* account between the Sinking Fund and the Serial Bond methods for the three main items of Metropolitan debt, Park, Sewerage and Water, would be about *twenty-six millions of dollars*, even if the bonds had been issued in Serial form at a one-half per cent *higher* rate than under the Sinking Fund form. The difference in the actual *cost* to tax payers, between the two methods, is also shown by a subsequent table to be about \$8,360,000, on a 3½% basis.

STATE CONTINGENT DEBT (Excepting Armory Loan of \$1,893,000).

	3 Per cent.	3 1-2 Per cent.	Total.	Interest.	Premiums.
Sewerage .	\$7,989,912	\$2,980,000	\$10,969,912	\$13,270,652	\$370,813
Parks . .	2,680,000	8,350,000	11,030,000	14,826,000	739,160
Water . .	10,900,000	23,600,000	34,500,000	45,532,875	2,300,487
	\$21,569,912	\$34,930,000	\$56,499,912	\$73,629,527	\$3,410,460
				3,410,460	
				\$70,219,067	
				56,499,912	

Total, principal and interest **\$126,718,979**

If the above 3 per cents had been issued as Serial 40-year Bonds at 3½ per cent, and the above 3½'s had been issued as Serial 40-year Bonds at 4 per cent, the difference in *interest* between the Sinking Fund method and the Serial Bond method would be:—

Principal.			Interest.	Principal and Interest.
\$21,569,912	3%	40 y. }		
34,930,000	3½%	.. .. }	\$70,219,067	\$126,718,979
		(Sinking Fund)		
1. \$56,499,912				
		Interest.		
\$21,500,000	3's at 3½%.			
	40 y. $\frac{1}{40}$			
	each year,	\$15,426,240		
35,000,000	3½% 's at			
	4% . 40 y. $\frac{1}{40}$			
	each year,	28,700,000		
2. \$56,500,000			44,126,240	
				\$100,626,240
Difference in <i>interest</i> in favor of Serial Bonds, \$26,092,827				
(Dec. 10, 1902)				

For additional details, see Appendix, pp. 40 to 50.

But even if the above \$56,000,000 (using round numbers) is so successfully financed by the Sinking Fund method as to pay the principal of the debt at the end of 40 years, yet it is a more expensive method than the Serial Bond method (due to the difference in interest), whether the Sinking Fund is based upon a $3\frac{1}{2}$ per cent or 4 per cent or even 5 per cent basis, as appears by the following, computed by the Robinsonian Sinking Fund tables, and any excess of such expense involves corresponding additional hazard.

	3½% basis. Decimal for \$1 for Sinking Fund, be- ing .011909 for 39 years.*	4% basis. Decimal for \$1 for Sinking Fund, be- ing .010635 for 39 years.*	5% basis. Decimal for \$1 for Sinking Fund, be- ing .008347 for 39 years.*
\$56,000,000 Sinking Fund requirements for 40-year loan,	\$26,140,296	\$23,226,840	\$18,229,848
\$56,000,000 for 40-years interest at 3½%,	78,400,000	78,400,000	78,400,000
Cost of loan by Sink- ing Fund method,	\$104,540,296	\$101,626,840	\$96,629,848
\$56,000,000 40-yr. Serial Bonds, $\frac{1}{2}$ % payable yearly, \$56,000,000			
Interest (an- nually di- minishing) at 3½%, 40,180,000†			
Cost of loan, Serial Bond			
method, \$96,180,000	96,180,000	96,180,000	96,180,000
Difference in cost in favor of Serial Bond method,	\$8,360,296	\$5,446,840	\$449,848

It is thus shown that legislation is desirable to enable the municipalities involved to diminish the needless risk and cost of the great Metropolitan loans which they are compelled to meet.

Such legislation may be by a general law giving to any town or city in the District the option of paying to the State outright, any part or the whole of its share of the Metropolitan debts, and thereafter financing itself the debt so paid. The

* 39 years, instead of 40, is taken for the decimal, because one year is necessarily allowed for the practical operation of the Sinking Fund. There are also but 39 payments; following the practice at the Boston City Hall. Should the calculations be for semi-annual payments, or should the decimal for 40 years be taken, with 40 payments, the variations in either case will be too slight to alter the principle in favor of Serial Bonds.

† For details see Appendix, pp. 49, 50.

new law should also provide for the possible earlier redemption than the date of maturity of any bonds a town or city might issue to pay such debt, and for refunding them, a very serious omission in the present laws for State loans.*

How such a proposed law would operate appears from the following illustration in Brookline's case.

Brookline's proportion of the <i>principal</i> of the Metropolitan <i>Park, Boulevard and Nantasket</i> debt, under the present quinquennial apportionment, is	\$625,957 50
Brookline's proportion of the <i>principal</i> of the Metropolitan <i>Sewer</i> debt, South system, is	1,481,269 98
Total	<hr/> \$2,107,227 48

Under the present apportionment, and under the State's <i>Sinking Fund</i> method of paying the Metropolitan 40 year bonds, the cost to Brookline of the <i>Park, Boulevard and Nantasket</i> debt, from 1905 to 1943, inclusive, for sinking fund and interest, will be	\$1,000,186 37
The cost to Brookline of the Metropolitan <i>Sewer</i> debt, under the State's <i>Sinking Fund</i> method, from 1905 to 1943, inclusive, for sinking fund and interest, will be	2,638,219 53
Total	<hr/> \$3,638,405 90

(The above figures are furnished by the Town Accountant of Brookline, and appear in detail for each year to 1943, in the Appendix.)

If, instead of the *Sinking Fund* method, the State employed the *Serial Bond* method, in successful use for municipal loans in Massachusetts, and expressly authorized by Chapter 133, Acts of 1882, now Revised Laws, Chapter 27, Section 13,

* Congress has passed refunding acts to the advantage of the country, which offer precedents for our State. "Early convertibility" is the American policy. The action of Congress in one instance is said to have prevented seasonable refunding, and proved to be a most serious error, according to John Sherman, who affirms that the law enacted by Congress, April 12, 1866, for the conversion of United States notes into interest-bearing bonds, became "by far the most injurious and expensive financial measure ever enacted by Congress," * * * * "adding fully \$300,000,000 of interest that might have been saved by the earlier refunding of outstanding bonds into bonds bearing 4 to 5 per cent interest." (Sherman's Recollections, I., p. 384.)

and which Brookline has adopted for fifty-eight loans since 1886, not only would the saving to tax payers be large, but the safety and success of the loans would be assured; whereas under the present Sinking Fund method there is an expense and a risk that tax payers ought not to be subjected to against their will.

The difference in the operation of the two methods as applied at present to Brookline, is approximately as follows.

Brookline's share of the *principal* of these two Metropolitan debts — *Parks* and *Sewers* — equals, in round numbers \$2,000,000 as appears above. The outstanding bonds are on 40 years time, issued at various dates at 3% and 3½%.

Total cost, principal and interest, under *Sinking Fund* method, as given by the Town Accountant, for the unexpired terms of bonds \$3,633,405

Total cost of \$2,000,000 at 3%, for full term of 40 years, *Serial Bond* method \$3,230,000
Difference in favor of *Serial Bond* method **403,405**
3,633,405

Total cost of \$2,000,000 at 3½%, for full term of 40 years, *Serial Bond* method \$3,332,500
Difference in favor of *Serial Bond* method **300,905**
3,633,405

Total cost of \$2,000,000 at 3½%, for full term of 40 years, *Serial Bond* method \$3,435,000
Difference in favor of *Serial Bond* method **198,405**
3,633,405

Total cost of \$2,000,000 at 3¾%, for full term of 40 years, *Serial Bond* method \$3,537,500
Difference in favor of *Serial Bond* method **95,905**
3,633,405

For details see Appendix, pp. 54 to 57.

The difference in the *interest* account between the *Sinking Fund* and the *Serial Bond* methods for \$2,000,000 for the full term of a 40 years loan for both loans, at 3%, 3½% and 4% appears from the following.

	3%	3½%	4%
\$2,000,000. Interest under Sinking Fund method . .	\$2,400,000	\$2,800,000	\$3,200,000
Same, under Serial Bond method	1,230,000	1,435,000	1,640,000
Difference in interest in favor of Serial Bond	\$1,170,000	\$1,365,000	\$1,560,000

But even if the Sinking Fund is kept intact, and is so successfully invested as to pay the principal, \$2,000,000, of the debt at the end of 40 years, yet it is more expensive than the Serial Bond method, whether the Sinking Fund is based upon a 3½%, 4%, 4½% or 5% basis,* as appears by the following computed by the Robinsonian Sinking Fund tables.

	3½% basis. Decimal for \$1 for Sinking Fund, being .011969 for 39 years. †	4% basis. Decimal for \$1 for Sinking Fund, being .010635.	4½% basis. Decimal for \$1 for Sinking Fund being .009431.	5% basis. Decimal for \$1 for Sinking Fund, being .008247.
\$2,000,000 Sinking Fund, requirements for 40-year loan,				
\$2,000,000 for 40 years, interest at 3½%,	\$933,582	\$829,530	\$735,618	\$651,066
	2,800,000	2,800,000	2,800,000	2,800,000
Cost of loan by Sinking Fund method,	\$3,733,582	\$3,629,530	\$3,535,618	\$3,451,066
\$2,000,000, 40 year Serial Bonds, $\frac{1}{40}$ payable yearly, \$2,000,000				
Interest (annually diminishing) at 3½%, 1,435,000				
Cost of loan Serial Bond method, \$3,435,000	3,435,000	3,435,000	3,435,000	3,435,000
Difference in favor of Serial Bond method,	\$298,582	\$194,530	\$100,618	\$16,066

*Sinking Funds are, as a rule, now estimated as earning on a 3 per cent basis only, in actual practice.

† 39 years, instead of 40, is taken for the decimal, because one year is allowed for the practical operation of the Sinking Fund method. There are also but 39 payments.

To show what Brookline would pay *each year* from 1905 to 1944, both inclusive — a period of 40 years — under the State's mode of assessment as at present apportioned, and also under the proposed Serial Bond mode for the town to adopt,* a table is given in the Appendix, (pp. 54 to 57) by which it is seen that the payments under the proposed method are larger at the beginning than by the State method, but they become smaller each year, until at the end the total saving is from about \$200,000 to about \$400,000 according to the rate per cent of the loan.*

These larger initial payments under Serial Bonds are well understood. Some would avoid them in order to put more rather than less upon their successors. But in the Metropolitan District successors of today already have far more to bear than their predecessors who could have borne more. The generation to come will have its full share of new tax burdens. The debt-incurring tendency is to be restrained by a present liability, rather than be encouraged by shifting that liability to a later generation.

It is thirty years since the Massachusetts municipal indebtedness act (1875, ch. 209), intended to hold towns and cities in check, was passed. In that time the assessed valuation of the Metropolitan District has increased from about \$1,142,000,000 to \$1,972,000,000, or 72+%; but the debt of that district in the same period (exclusive of its share of the State "direct" debt, and of county debts), has grown from about \$56,545,000 to \$194,062,000, or 243% (May 1, 1874, to May 1, 1904), and now, January, 1905, the debt is understood to be at least \$200,000,000, or an increase of 253%.†

Among many unavoidable large expenses that our successors are to meet, is an additional water supply, to be taken in hand, it is said, even before the present forty-year water

* Observe, in the table [Appendix 16], that from 1934 to 1943 inclusive, under the Town Accountant's columns, there is a diminution in payments, due to the earlier maturity of some of the State bonds. Otherwise a still larger saving would appear under the Serial Bond columns, wherein the Bonds are continued for 40 and for 50 years from 1906.

† See Appendix for details of valuation and debt. pp. 35, 36.

bonds mature, and the water bonds of today form the largest item of the Metropolitan debts. The great sewerage system must be extended. A special provision of the Sinking Fund clause in the Metropolitan sewerage act (1889, ch. 489, §12) requires a progressive apportionment, designed to impose upon our successors a tax more than double that at first, the ratio of increase being 1-80th during each of the first ten years, 1-60th during each of the second ten years, 1-30th during each the third ten years, and the remainder to be equally divided during the next ten years. The sewerage debt is already about \$25,000,000.

Moreover, our "successors" are, for a large part, to be *ourselves*; for the tax payers of today, between 25 and 40 years of age, must still be meeting our Metropolitan debts when from 55 to 70 years of age. The "successor" excuse is not altogether municipal prudence, it is rather an evasion.

The Act of the Legislature now proposed to give relief to the municipalities throughout the Metropolitan District, provides simply that any town or city may, at its option, at any time or times, pay to the State such part or all of its proportion of the Metropolitan debts that it is then liable for to the State, and, to do this, may issue its own bonds, in Serial form if it so chooses, for not exceeding 50 years, which may be redeemed after 20 years, and if refunded may be again redeemed after 10 years. Such payment to the State is to absolve the municipality from further liability to the State therefor, and is also to absolve the other municipalities affected thereby in the Metropolitan District; but an increase in the percentage of any subsequent apportionment for a municipality that has paid the State under this act, requires payment thereafter only of such excess of percentage upon the principal unpaid to the State. The State shall apply the money so received to the payment of so much of the Metropolitan debt of the class of debt paid, as the amount paid equals. The annual maintenance charges will continue, unaffected by the proposed act.

The following are some of the precedents for *50 year* bonds, in Massachusetts:—

1. 1885, ch. 377, and 1887, ch. 101. \$2,500,000, beyond debt limit. Suffolk County Court House. Serial bond loan.
2. 1886, ch. 304. \$2,500,000, beyond debt limit. Constructing parks in or near Boston.
3. 1887, ch. 312. \$400,000, beyond debt limit. Payment for park lands in or near Boston.
4. 1888, ch. 392. \$600,000, beyond debt limit. Payment for park lands for Boston.
5. 1892, ch. 150. \$100,000, beyond debt limit. Payment for park lands for New Bedford.
6. 1892, ch. 155. \$100,000, beyond debt limit. Payment for park lands for Malden.
7. 1893, ch. 341. \$100,000, beyond debt limit. For park purposes for Waltham.
8. 1895, ch. 74. \$100,000, beyond debt limit. For park purposes for Dedham.
9. 1898, ch. 140. \$100,000, beyond debt limit. For park purposes for New Bedford.
10. 1902, ch. 231. \$100,000, beyond debt limit. For park purposes for Fall River.

Boston's \$850,000 *Serial Bond* loan, for the Suffolk County Court House, was on 50 years time at 3 per cent; was issued under the Act of 1885, Chap. 377; was placed at par; and the difference in the operation of that loan and the same amount under the Sinking Fund method appears from the following tables:—

I. DIFFERENCE IN INTEREST.

	Interest.	Principal and Interest.
\$850,000 at 3% for 50 y. Sinking Fund method,	\$1,275,000	\$2,125,000
850,000 " " " " " Serial Bond "	650,250*	1,500,250
Difference in interest in favor of Serial Bond,	\$624,750	\$624,750

II. DIFFERENCE IN COST.

\$850,000 at 3% for 50 years,	\$1,275,000
Sinking Fund requirements on 3% basis, decimal for \$1 being .008945, for 49 years, with 49 payments,	372,559
Cost of loan, Sinking Fund method,	\$1,647,559
\$850,000 Serial Bond, \$17,000 payable yearly, Interest (annually diminishing) at 3%,	\$850,000 650,250*
Cost of loan Serial Bond method,	1,500,250
Saving by Serial Bond method,	\$147,309

*For detail see Appendix, pp. 58 to 60.

The readjustment of both the State and the City of Boston bonded indebtedness (about \$95,000,000, gross, each) or of a large part of it, into State and City convertible consols, or otherwise, may be in order ; not forcibly, without the consent of the bondholders, as tried in Virginia, which next to Massachusetts is the heaviest indebted State in the Union, but by the voluntary co-operation of both borrower and lender, and to their mutual advantage.

A modern Banking House tersely summarizes the merits of Serial Bonds, for private and for public corporations, thus :—

**“WHEN A BOND ISSUE IS SERIAL, THE INVEST-
MENT GROWS SAFER AS IT GROWS OLDER.”**

ALFRED D. CHANDLER.

Brookline, January 20, 1905.

APPENDIX.

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Proposed Act.**Commonwealth of Massachusetts.**

In the year One Thousand Nine Hundred and Five.

AN ACT

TO AUTHORIZE TOWNS AND CITIES TO PAY CERTAIN METROPOLITAN DEBTS.

Be it enacted by the Senate and House of Representatives in General Court assembled, and by the authority of the same, as follows:

1 SECTION 1. Any town or city may, at any time or times,
2 pay to the Treasurer of the Commonwealth any part or
3 all of its proportion of the principal sum or sums of
4 any part or all of the Metropolitan water, sewer, park or
5 boulevard debts, with accrued interest, and sinking fund
6 charges, expenses, and deficiency, if any, thereon to the day
7 of such payment, and then apportioned as any such town's
8 or city's share of any such Metropolitan debt or debts.

1 SECTION 2. To that end a town or city may at any time
2 or times incur indebtedness beyond the limit of municipal
3 indebtedness to an amount not exceeding two per centum
4 of its assessed valuation at such time, and any such town
5 or city is hereby authorized to issue from time to time
6 bonds, notes, or scrip, not exceeding in amount such two
7 per centum of its assessed valuation at such time, to be
8 denominated Metropolitan Loan, Act of 1905, bearing interest
9 not exceeding five per centum per annum, payable semi-
10 annually, the principal to be payable in periods of not more
11 than fifty years from the date of issuing such bonds, notes,
12 or scrip, which shall, at the option of such town or city, be
13 redeemable at par, on any interest-paying day, at any time
14 after twenty years from their respective dates of issue, the
15 bonds, notes, or scrip so to be redeemed in all cases to be

16 specified by class, date and number, in the order of their
 17 numbers and issue, beginning with the first numbered and
 18 issued, in a public notice to be given by the Treasurer of
 19 the town or city so redeeming, and, in three months after
 20 the date of such public notice, the interest on such bonds,
 21 notes, or scrip, so to be redeemed shall cease. Bonds,
 22 notes, or scrip so redeemed may be refunded wholly or in
 23 part for a term not exceeding fifty years from the date of
 24 the bonds, notes, or scrip that they retire, and subject to
 25 the provisions of this act, but such bonds, notes, or scrip
 26 so refunded, shall, at the option of such town or city, be
 27 redeemable at par, on any interest-paying day, at any time
 28 after ten years from their respective dates of issue, and as
 29 hereinbefore provided for the redemption of original issues.

1 SECTION 3. A town or city may authorize temporary loans
 2 to be made by its selectmen and treasurer, or by its mayor
 3 and treasurer, in anticipation of the issue of bonds, notes,
 4 or scrip hereby authorized, or in anticipation of any pay-
 5 ments to be made under this act.

1 SECTION 4. The provisions of section thirteen of chapter
 2 twenty-seven of the Revised Laws of Massachusetts,
 3 authorizing annual proportionate payments in lieu of a
 4 sinking fund for the payment of any municipal debt, shall,
 5 at the option of any such town or city, apply to any debt
 6 or debts incurred under this act.

1 SECTION 5. Any payment or payments made under this
 2 act by any town or city to the Treasurer of the Common-
 3 wealth, shall thereafter absolve such town or city, and
 4 shall also absolve all other towns and cities affected there-
 5 by in the Metropolitan District, from any further liability
 6 therefor to the Commonwealth, or for any interest or
 7 sinking fund charges thereon, except for any deficiency of
 8 interest due for the payment and cancellation of bonds
 9 under section six of this act. Any town or city making a
 10 payment or payments to the Treasurer of the Common-

11 wealth under this act, shall, for each succeeding apportion-
12 ment, be liable only for such percentage thereof as exceeds
13 the total percentage of any payment or payments already
14 so made.

1 SECTION 6. The Treasurer of the Commonwealth shall
2 apply the money received from any town or city under
3 this act to the payment and cancellation of bonds of the
4 class of Metropolitan debt or debts so paid for by such
5 town or city ; he shall make a detailed record in the Treas-
6 urer's books of the bonds so paid for and cancelled ; and
7 the amount of the bonds of each class that have been so
8 paid for, and cancelled, shall be deducted respectively from
9 the amount of such class of the outstanding debt of the
10 Commonwealth.

1 SECTION 7. This act shall take effect upon its passage.

DEBTS OF THE STATES.

(From the Commercial and Financial Chronicle, May 28, 1904.)

1. Alabama	Oct. 1, 1903	\$9,357,600
2. Arkansas	April 4, 1904	1,256,000
3. California	May 1, 1904	2,277,500
4. Colorado	Dec. 1, 1902	3,973,483
5. Connecticut	Oct. 1, 1903	448,726
6. Delaware	Jan. 1, 1904	811,750
7. Florida	Jan. 1, 1904	601,567
8. Georgia	Dec. 31, 1903	7,536,000
9. Idaho	May 1, 1904	692,500
10. Illinois		None
11. Indiana	Nov. 1, 1903	2,437,615
12. Iowa		None
13. Kansas	July 1, 1903	632,000
14. Kentucky	Sept. 1, 1903	207,394
15. Louisiana	Mar. 1, 1904	12,248,078
16. Maine	Jan. 1, 1904	1,913,000
17. Maryland	Sept. 30, 1903	7,101,926
18. MASSACHUSETTS		
Direct debt,*	Dec. 31, 1904	\$30,809,750
Contingent debt,†	" " "	64,989,412
		<hr/> \$95,799,162‡
19. Michigan		None
20. Minnesota	April 1, 1904	2,759,000
21. Mississippi	Oct. 1, 1903	3,014,950
22. Missouri	Jan. 1, 1903	487,000
23. Montana		None
24. Nebraska		None
25. Nevada	Jan. 1, 1904	250,100
26. New Hampshire	June 1, 1903	1,551,148
27. New Jersey		None
28. New York	April 1, 1904	9,510,660
29. North Carolina	Dec. 1, 1903	6,598,950
30. North Dakota	July 1, 1903	692,300
31. Ohio		None
32. Oregon		None
33. Pennsylvania	Dec. 1, 1903	4,718,817
34. Rhode Island	Jan. 1, 1904	2,475,936
35. South Carolina	Jan. 1, 1904	6,514,674
36. South Dakota	April 1, 1904	704,000
37. Tennessee	Sept. 1, 1903	15,727,466
38. Texas	May 1, 1904	3,989,400
39. Utah	Jan. 1, 1904	900,000
40. Vermont	July 1, 1903	426,195
41. Virginia	May 1, 1904	24,384,142
42. Washington	April 1, 1904	1,485,000
43. West Virginia		None
44. Wisconsin	May 1, 1904	2,251,000
45. Wyoming	Feb. 1, 1904	260,000
		<hr/> \$235,995,039

* On the State at large.

† On the Metropolitan District of Boston and vicinity.

‡ About 40 per cent of the total indebtedness of all the States.

THE METROPOLITAN DISTRICT.

May 1, 1874.

Cities.	Valuation.	Municipal Indebtedness.	Percentage.
Boston	\$798,755,050	\$43,879,140	.055
Cambridge	66,576,671	3,023,200	.045
Chelsea	18,722,436	1,548,650	.083
Everett	4,408,525	127,852	.029
Lynn	28,368,913	1,931,000	.068
Malden	9,337,700	425,200	.045
Medford	9,786,040	479,100	.049
Melrose	4,178,425	309,700	.074
Newton	28,081,445	387,000	.014
Quincy	7,123,200	106,503	.015
Somerville	30,824,100	956,354	.031
Waltham	10,244,428	430,350	.042
Woburn	8,655,576	583,971	.067
Towns.			
Arlington	6,014,116	311,916	.051
Belmont	3,835,218	42,610	.011
Braintree	2,615,250	41,429	.016
Brookline	27,940,200	796,704	.028
Canton	3,020,432		
Cohasset	2,231,762	15,910	.007
Dedham	6,008,056	15,000	.002
Dover	398,480	4,150	.01
Hingham	3,141,084	38,225	.012
Hull	630,028	14,593	.023
Hyde Park	7,069,323	263,028	.037
Milton	6,864,600	9,500	.001
Nahant	6,250,244	15,200	.002
Needham	4,415,706	56,200	.013
Revere	1,922,185	41,500	.022
Saugus	1,796,233	48,000	.027
Stoneham	2,991,069	111,532	.038
Swampscott	2,486,135	50,770	.02
Wakefield	3,985,335	121,857	.031
Watertown	8,041,910	96,893	.012
Wellesley	(Not then incorporated)		
Weston	1,384,666	22,558	.016
Westwood	(Not then incorporated)		
Weymouth	5,846,299	38,500	.007
Winchester	4,758,890	98,100	.021
Winthrop	805,440	50,645	.063
<hr/>			
Lexington (Water)	\$1,139,510,170 2,946,424	\$56,492,840 52,400	.0495
<hr/>			
	\$1,142,456,594	\$56,545,240	
<hr/>			
Entire State	\$1,831,601,165	\$80,427,245	.044

[APPENDIX 4.]

THE METROPOLITAN DISTRICT.

May 1, 1904.

Cities.	Valuation.	Municipal Indebtedness.	Sinking Funds.	Percentage.
Boston	\$1,287,038,851	\$85,912,022	\$28,560,826	.069
Cambridge	104,827,600	9,176,400	2,371,799	.087
Chelsea	24,413,629	1,619,500	576,220	.066
Everett	21,504,000	1,261,181	201,822	.058
Lynn	55,343,902	5,309,450	1,618,612	.095
Malden	32,262,960	1,679,650	394,205	.052
Medford	21,042,150	1,769,363	619,204	.084
Melrose	15,237,855	1,086,074	189,581	.071
Newton	62,975,710	6,965,533	2,182,910	.110
Quincy	24,032,370	1,673,393		.069
Somerville	58,056,700	1,505,500		.025
Waltham	22,609,296	1,312,000	480,155	.058
Woburn	10,838,359	249,230	1,699	.022
Towns.				
Arlington	9,891,225	632,798	47,778	.063
Belmont	5,526,045	222,800	29,785	.040
Braintree	4,907,735	335,500	95,856	.068
Brookline	88,274,800	1,543,335		.017
Canton	3,700,590	124,000		.033
Cohasset	6,407,229	57,125		.008
Dedham	10,798,234	333,200		.030
Dover	928,028			
Hingham	4,363,449	42,300		.009
Hull	4,546,126	203,464	64,676	.044
Hyde Park	12,654,225	258,000		.020
Milton	20,791,195	410,000		.019
Nahant	5,320,743	3,724		
Needham	4,041,200	298,500		.073
Revere	12,197,225	429,125		.035
Saugus	4,333,853	128,550	3,500	.029
Stoneham	4,904,206	281,352		.057
Swampscott	7,695,293	434,170	18,909	.056
Wakefield	8,345,595	796,000		.095
Watertown	12,159,549	679,300		.055
Wellesley	11,107,139	389,000	113,293	.035
Weston	5,497,490	32,000		.005
Westwood	2,079,823			
Weymouth	7,065,363	579,500	210,925	.082
Winchester	10,293,650	687,000		.066
Winthrop	8,921,850	277,204	32,031	.031
	<u>\$1,966,935,242</u>	<u>\$128,697,243</u>	<u>\$37,813,786</u>	<u>.0654</u>
Lexington (Water)	5,827,290	320,000		
	\$1,972,762,532	\$129,017,243		
Metropolitan debts, about		65,000,000	6,230,876	
		\$194,062,243	\$44,044,662	
"Direct" debt (about 60% of),		18,000,000	9,000,000	
Totals,		\$212,062,243	\$53,044,662	
Entire State	\$3,251,804,634	\$195,062,222	\$53,403,621	.0599
Metropolitan				
debts, about		65,000,000	6,230,876	
State "direct" debt,		30,809,750	15,233,154	
County debts (Dec. 31, 1904),		3,221,726		
Grand Totals,		\$294,093,698	\$74,867,651	

TOWN OF BROOKLINE.

STATEMENT of Money borrowed from February, 1886, to January, 1904,
inclusive, in the form of *Serial Bonds*.

No.	Purpose Issued.	Date.	Payable Annually.	Amount of Loan.	Rate.
1.	Water Scrip	Feb. 1, 1886	1-10th	\$100,000	3.65%
2.	White Place	Nov. 1, 1886	1-5th	12,000	3 $\frac{1}{2}$
3.	Sumner Road Bridge	Nov. 1, 1887	1-3d	12,000	3
4.	Washington st. "	Nov. 1, 1887	1-10th	48,000	3
5.	Grammar and Prima- ry School buildings	Nov. 1, 1887	1-10th	80,000	3
6.	Beacon Street . . .	July 1, 1889	1-10th	168,000	4
7.	Playgrounds, sewer, school houses, sts.	Feb. 1, 1889	1-10th	89,000	4
8.	Beacon st. Pub. Lib., schools	June 1, 1889	1-10th	185,000	4
9.	Beacon Street . . .	Jan. 1, 1890	1-10th	70,000	4
10.	Parks	Aug. 1, 1891	1-20th	130,000	4
11.	Water Works	Jan. 1, 1892	1-30th	30,000	4
12.	Bridge	Jan. 1, 1892	1-10th	10,000	4
13.	Engine House	Jan. 1, 1892	1-3d	37,000	4
14.	Parks	July 1, 1892	1-20th	70,000	4
15.	Parks	Sept. 1, 1892	1-10th	40,000	4
16.	Bridge, Library, schools, land, street	June 1, 1892	1-10th	200,000	4
17.	Parks	Mar. 1, 1893	1-20th	80,000	4
18.	Parks	June 15, 1893	1-20th	125,000	3 $\frac{1}{2}$
19.	Parks	Mar. 1, 1893	1-10th	26,000	4
20.	Parks	June 15, 1893	1-10th	6,500	3 $\frac{1}{2}$
21.	Water Works	June 15, 1893	1-30th	61,950	3 $\frac{1}{2}$
22.	Water Works	June 15, 1893	1-5th	32,500	3 $\frac{1}{2}$
23.	Water Works	July 1, 1894	1-30th	133,980	4
24.	Water Works	July 1, 1904	1-6th	6,000	4
25.	School, bridge, and brook	Nov. 1, 1894	1-20th	96,500	4
26.	School	April 1, 1894	1-10th	56,000	4
27.	Sewers	Feb. 1, 1895	1-10th	12,500	4
28.	Water Works	June 15, 1895	1-30th	30,000	3 $\frac{2}{5}$
29.	Park, brook, hospitals	June 15, 1895	1-10th	17,000	3 $\frac{1}{10}$
30.	Streets and school .	June 15, 1895	1-20th	186,000	3 $\frac{2}{5}$
31.	School	Jan. 1, 1896	1-20th	50,000	3 $\frac{1}{2}$
32.	Parks	Jan. 1, 1896	1-20th	21,600	3 $\frac{1}{2}$
33.	Schools	May 1, 1896	1-20th	10,000	3 $\frac{1}{2}$
34.	Park	May 1, 1896	1-10th	4,000	3 $\frac{1}{2}$
35.	Sewer	July 1, 1896	1-3d	9,000	3 $\frac{1}{2}$
36.	Schools	Aug. 1, 1896	1-10th	25,000	3 $\frac{1}{2}$
37.	Water	Aug. 1, 1896	1-30th	18,000	3 $\frac{1}{2}$
38.	Bath House	July 1, 1897	1-10th	25,000	3 $\frac{2}{5}$
39.	Playground, brook, and school	July 1, 1897	1-10th	94,000	3 $\frac{2}{5}$
40.	Water	Jan. 1, 1898	1-20th	15,000	3 $\frac{2}{5}$
41.	Bridge	Oct. 1, 1898	1-20th	25,000	3 $\frac{2}{5}$
42.	Water	Jan. 1, 1899	1-10th	14,000	3.35
43.	Police Station . . .	Mar. 1, 1899	1-5th	59,000	3.45

Purpose Issued.	Date.	Payable Annually.	Amount of Loan.	Rate.
44. Parks	Nov. 1, 1899	1-5th	25,000	3½
45. Bridge	Oct. 1, 1898	1-20th	25,000	3½
46. Bridge	Mar. 1, 1899	1-20th	50,000	3½
47. Police	Dec. 1, 1899	1-10th	75,000	3½
48. Boylston street . .	April 1, 1901	1-10th	250,000	3.15
49. Boylston street . .	June 1, 1902	1-10th	35,000	3.10
50. Water Works . . .	June 1, 1902	1-20th	24,000	3.10
51. School and play-ground	Jan. 1, 1903	1-10th	75,000	3.15
52. Water Works . . .	Jan. 1, 1903	1-20th	74,000	3½
53. Parks	Jan. 1, 1903	1-20th	100,000	3½
54. Playgrounds	Jan. 1, 1903	1-20th	100,000	3½
55. Water Works	Jan. 1, 1904	1-20th	40,000	3½
56. School	Jan. 1, 1904	1-10th	80,000	3½
57. Streets	Jan. 1, 1904	1-10th	20,000	3½
58. Schools and Library	Jan. 1, 1904	1-20th	110,000	3½
			<u>\$3,608,530</u>	

Calling the average rate of the above 3½%, and the average time 15 years, then:—

\$3,600,000 @ 3½% for 15 years, interest is \$1,890,000
 " " " " payable 1-15 each year,
 interest is * 1,008,000

Difference in interest in favor of Serial Bonds \$882,000

* See the table following.

TOWN OF BROOKLINE.

\$3,600,000 at 3½% for fifteen years, paying 1-15, or \$240,000 each year.

	\$3,600,000 at 3½% for 1 year	Interest.
1	<u>\$3,600,000</u> 240,000	<u>\$126,000</u>
2	<u>\$3,360,000</u> 240,000	117,600
3	<u>\$3,120,000</u> 240,000	109,200
4	<u>\$2,880,000</u> 240,000	100,800
5	<u>\$2,640,000</u> 240,000	92,400
6	<u>\$2,400,000</u> 240,000	84,000
7	<u>\$2,160,000</u> 240,000	75,600
8	<u>\$1,920,000</u> 240,000	67,200
9	<u>\$1,680,000</u> 240,000	58,800
10	<u>\$1,440,000</u> 240,000	50,400
11	<u>\$1,200,000</u> 240,000	42,000
12	<u>\$960,000</u> 240,000	33,600
13	<u>\$720,000</u> 240,000	25,200
14	<u>\$480,000</u> 240,000	16,800
15	<u>\$240,000</u> 240,000	8,400
	<u>000,000</u>	
	Total interest	\$1,008,000

Metropolitan Park Loans.

Summary of Interest Comparisons between Sinking Fund and Serial Bonds, the rate for the latter being raised a fraction.

Principal.		Interest.	Principal and Interest.
\$2,680,000 3 % 40 year	} (Sinking fund)	\$14,826,600	\$25,116,840
8,350,000 3½ %			
1. \$11,030,000			
2. \$11,030,000 3½ % 20 year	1-20 each year,	\$4,053,537	\$15,083,537
3. 11,030,000 4 % 20 "	1-20 " "	4,632,600	15,662,600
4. 11,030,000 3½ % 40 "	1-40 " "	7,912,964	18,942,964
5. 11,030,000 4 % 40 "	1-40 " "	9,044,600	20,074,600

(Dec. 10, 1902.)

Metropolitan Park Loans.

Issued.	Amount.	Rate.	Due.	Interest.	Premiums.
1. 1894	\$1,000,000	3½ %	1934	\$1,400,000	108.555
2. 1894	100,000	3½ %	1934	140,000	109.375
3. 1894	500,000*	3½ %	1934	700,000	109
4. 1895	200,000	3½ %	1934	280,000	par
5. 1896	1,400,000	3½ %	1937	2,009,000	105.829
6. 1897	2,000,000	3½ %	1936	2,730,000	106.+
7. 1897	1,600,000*	3½ %	1936	2,184,000	106.+
8. 1898	1,000,000	3½ %	1938	1,400,000	110.459
9. 1898	100,000*	3½ %	1938	140,000	110.459
10. 1899	1,025,000	3	1939	1,230,000	100.64
11. 1899	500,000*	3	1939	600,000	100.64
12. 1900	80,000	3	1939	93,000	100.79
13. 1900	325,000*	3	1940	390,000	100.29
14. 1901	650,000	3	1941	780,000	100.10
15. 1901	100,000†	3	1941	120,000	100.10
16. 1902	450,000	3½ %	1940	630,000	108.29
	\$11,030,000			\$14,826,000	
				739,160	
				\$14,086,840	
				11,030,000	
Principal and interest . . .				\$25,116,840	

For Park purposes \$7,905,000

*For parkway purposes (Series Two), \$3,025,000

† " Nantasket 100,000

\$11,030,000

"One half the amount for boulevards is paid by the State at large, the balance by the Metropolitan district."—(*Auditor's Report*, 1901, p. 474.)

[APPENDIX 7.]

**Cost of Outstanding Metropolitan Park Loans, Issued Between
1894 and 1902, Both Inclusive, a Total of \$11,030,000, for
20 Years at 3½%, Paying 1-20 or \$551,500 Each Year.**

			Interest.	Principal and Interest.
	\$11,030,000 at 3½% for 1 year		\$386,050	
1	551,500			\$937,550
	\$10,478,500	" "	366,747	
2	551,500			918,247
	\$9,927,000	" "	347,445	
3	551,500			898,945
	\$9,375,500	" "	328,142	
4	551,500			897,642
	\$8,824,000	" "	308,840	
5	551,500			860,340
	\$8,272,500	" "	289,537	
6	551,500			841,037
	\$7,721,000	" "	270,235	
7	551,500			821,735
	\$7,169,500	" "	250,932	
8	551,500			802,432
	\$6,618,000	" "	231,630	
9	551,500			783,130
	\$6,066,500	" "	212,327	
10	551,500			763,827
	\$5,515,500	" "	193,042	
11	551,500			744,542
	\$4,963,500	" "	173,722	
12	551,500			725,222
	\$4,412,000	" "	154,420	
13	551,500			705,920
	\$3,860,500	" "	135,117	
14	551,500			686,617
	\$3,309,000	" "	115,815	
15	551,500			667,315
	\$2,757,500	" "	96,512	
16	551,500			648,012
	\$2,206,000	" "	77,210	
17	551,500			628,710
	\$1,654,500	" "	57,907	
18	551,500			609,407
	\$1,103,000	" "	38,605	
19	551,500			590,105
	\$551,500	" "	19,302	
20	551,500			570,802
	000,000			
			\$4,053,537	\$15,083,537

[APPENDIX 8.]

**Cost of Outstanding Metropolitan Park Loans, Issued Between
1894 and 1902, Both Inclusive, a Total of \$11,030,000 for
20 Years at 4%, Paying 1-20 or \$551,500 Each Year.**

			Interest.	Principal and Interest.
	\$11,030,000 at 4% for 1 year		\$441,200	
1	551,500			\$992,700
	<hr/> \$10,478,500	" "	419,140	
2	551,500			970,640
	<hr/> \$9,927,000	" "	397,080	
3	551,500			948,580
	<hr/> \$9,375,500	" "	375,020	
4	551,500			926,520
	<hr/> \$8,824,000	" "	352,960	
5	551,500			904,460
	<hr/> \$8,272,500	" "	330,900	
6	551,500			882,400
	<hr/> \$7,721,000	" "	308,840	
7	551,500			860,340
	<hr/> \$7,169,500	" "	286,780	
8	551,500			838,280
	<hr/> \$6,618,000	" "	264,720	
9	551,500			816,220
	<hr/> \$6,066,500	" "	242,660	
10	551,500			794,160
	<hr/> \$5,515,000	" "	220,600	
11	551,500			772,100
	<hr/> \$4,963,500	" "	198,540	
12	551,500			750,040
	<hr/> \$4,412,000	" "	176,480	
13	551,500			727,980
	<hr/> \$3,860,500	" "	154,420	
14	551,500			705,920
	<hr/> \$3,309,000	" "	132,360	
15	551,500			683,860
	<hr/> \$2,757,500	" "	110,300	
16	551,500			661,800
	<hr/> \$2,206,000	" "	88,240	
17	551,500			639,740
	<hr/> \$1,654,500	" "	66,180	
18	551,500			617,680
	<hr/> \$1,103,000	" "	44,120	
19	551,500			595,620
	<hr/> \$551,500	" "	22,060	
20	551,500			573,560
	<hr/> 000,000			
			<hr/> \$4,632,600	<hr/> \$15,662,600

**Cost of Outstanding Metropolitan Park Loans, Issued Between
1894 and 1902, Both Inclusive, a Total of \$11,030,000, for
40 Years at 3½%, Paying 1-40 or \$275,750 Each Year.**

			Interest.	Principal and Interest.
	\$11,030,000 at 3½% for 1 year		\$386,050	
1	<u>275,750</u>			\$661,800
	\$10,754,250	" "	376,398	
2	<u>275,750</u>			652,148
	\$10,478,500	" "	366,747	
3	<u>275,750</u>			642,497
	\$10,202,750	" "	357,096	
4	<u>275,750</u>			632,846
	\$9,927,000	" "	347,445	
5	<u>275,750</u>			623,195
	\$9,651,250	" "	337,793	
6	<u>275,750</u>			613,543
	\$9,375,500	" "	328,142	
7	<u>275,750</u>			603,892
	\$9,099,750	" "	318,491	
8	<u>275,750</u>			594,241
	\$8,824,000	" "	308,840	
9	<u>275,750</u>			584,590
	\$8,548,250	" "	299,188	
10	<u>275,750</u>			574,938
	\$8,272,500	" "	289,537	
11	<u>275,750</u>			565,287
	\$7,996,750	" "	279,886	
12	<u>275,750</u>			555,636
	\$7,721,000	" "	270,235	
13	<u>275,750</u>			545,985
	\$7,445,250	" "	260,583	
14	<u>275,750</u>			536,333
	\$7,169,500	" "	250,932	
15	<u>275,750</u>			526,682
	\$6,893,750	" "	241,281	
16	<u>275,750</u>			517,031
	\$6,618,000	" "	231,630	
17	<u>275,750</u>			507,380
	\$6,342,250	" "	221,978	
18	<u>275,750</u>			497,728
	\$6,066,500	" "	212,327	
19	<u>275,750</u>			488,077
	\$5,790,750	" "	202,676	

			Interest.	Principal and Interest.
20	275,750			478,426
	<u>\$5,515,000 at 3½% for 1 year</u>		193,025	
21	275,750			468,775
	<u>\$5,239,250</u>	" "	183,373	
22	275,750			459,123
	<u>\$4,963,500</u>	" "	173,722	
23	275,750			449,472
	<u>\$4,687,750</u>	" "	164,071	
24	275,750			440,821
	<u>\$4,412,000</u>	" "	154,420	
25	275,750			430,170
	<u>\$4,136,250</u>	" "	144,718	
26	275,750			420,468
	<u>\$3,860,500</u>	" "	135,117	
27	275,750			410,867
	<u>\$3,584,750</u>	" "	125,465	
28	275,750			401,215
	<u>\$3,309,000</u>	" "	115,815	
29	275,750			391,565
	<u>\$3,033,250</u>	" "	106,164	
30	275,750			381,914
	<u>\$2,757,500</u>	" "	96,512	
31	275,750			372,262
	<u>\$2,481,750</u>	" "	86,861	
32	275,750			362,611
	<u>\$2,206,000</u>	" "	77,210	
33	275,750			352,960
	<u>\$1,930,250</u>	" "	67,558	
34	275,750			343,308
	<u>\$1,654,500</u>	" "	57,907	
35	275,750			333,657
	<u>\$1,378,750</u>	" "	48,266	
36	275,750			324,016
	<u>\$1,103,000</u>	" "	38,605	
37	275,750			314,355
	<u>\$827,250</u>	" "	28,953	
38	275,750			304,703
	<u>\$551,500</u>	" "	18,292	
39	275,750			294,042
	<u>\$275,750</u>	" "	9,650	
40	275,750			285,400
	<u>000,000</u>			
			<u>\$7,912,964</u>	<u>\$18,942,964</u>

**Cost of Outstanding Metropolitan Park Loans, Issued Between
1894 and 1902, Both Inclusive, a Total of \$11,080,000, for
40 Years at 4%, Paying 1-40 or \$275,750, Each Year.**

			Interest.	Principal and Interest.
1	\$11,080,000 at 4% for 1 year		\$441,200	
	275,750			
	<hr/>			
2	\$10,754,250 " "		430,170	\$716,950
	275,750			
	<hr/>			
3	\$10,478,500 " "		419,140	705,920
	275,750			
	<hr/>			
4	\$10,202,750 " "		408,110	694,890
	275,750			
	<hr/>			
5	\$9,927,000 " "		397,080	683,860
	275,750			
	<hr/>			
6	\$9,651,250 " "		386,050	672,830
	275,750			
	<hr/>			
7	\$9,375,500 " "		375,020	661,800
	275,750			
	<hr/>			
8	\$9,099,750 " "		363,990	650,770
	275,750			
	<hr/>			
9	\$8,824,000 " "		352,960	639,740
	275,750			
	<hr/>			
10	\$8,548,250 " "		341,930	628,710
	275,750			
	<hr/>			
11	\$8,272,500 " "		330,900	617,680
	275,750			
	<hr/>			
12	\$7,996,750 " "		319,870	606,650
	275,750			
	<hr/>			
13	\$7,721,000 " "		308,840	595,620
	275,750			
	<hr/>			
14	\$7,445,250 " "		297,810	584,590
	275,750			
	<hr/>			
15	\$7,169,500 " "		286,780	573,560
	275,750			
	<hr/>			
16	\$6,893,750 " "		275,750	562,530
	275,750			
	<hr/>			
17	\$6,618,000 " "		264,720	551,500
	275,750			
	<hr/>			
18	\$6,342,250 " "		253,690	540,470
	275,750			
	<hr/>			
19	\$6,066,500 " "		242,660	529,440
	275,750			
	<hr/>			
				518,410

			Interest.	Principal and Interest.
	\$5,790,750 at 4% for 1 year		231,630	
20	275,750			507,380
	\$5,515,000	" "	220,600	
21	275,750			496,350
	\$5,239,250	" "	209,570	
22	275,750			485,320
	\$4,963,500	" "	198,540	
23	275,750			474,290
	\$4,687,750	" "	187,510	
24	275,750			463,260
	\$4,412,000	" "	176,480	
25	275,750			452,230
	\$4,136,250	" "	165,450	
26	275,750			441,200
	\$3,860,500	" "	154,420	
27	275,750			430,170
	\$3,584,750	" "	143,390	
28	275,750			419,140
	\$3,309,000	" "	132,360	
29	275,750			408,110
	\$3,033,250	" "	121,330	
30	275,750			397,080
	\$2,757,500	" "	110,300	
31	275,750			386,050
	\$2,481,750	" "	99,270	
32	275,750			375,020
	\$2,206,000	" "	88,240	
33	275,750			363,990
	\$1,930,250	" "	77,210	
34	275,750			352,960
	\$1,654,500	" "	66,180	
35	275,750			341,930
	\$1,378,750	" "	55,150	
36	275,750			330,900
	\$1,103,000	" "	44,120	
37	275,750			319,870
	\$827,250	" "	33,090	
38	275,750			308,840
	\$551,500	" "	22,060	
39	275,750			297,810
	\$275,750	" "	11,030	
40	275,750			286,780
	000,000			
			\$9,044,600	\$20,074,600

**Metropolitan Park Assessments for 1900, 1901, 1902, 1903,
and 1904.**

CITIES.	1900.	1901.	1902.	1903.	1904.
Boston	\$258,961 59	\$285,747 96	\$309,709 50	\$314,588 27	\$346,581 67
Cambridge	28,444 58	31,348 24	34,013 41	34,541 40	38,064 53
Chelsea	7,531 43	8,800 24	9,005 91	9,145 71	10,078 55
Everett	6,258 98	6,897 86	7,484 28	7,600 49	8,375 72
Lynn	14,788 70	16,298 36	17,684 01	17,958 53	19,790 23
Malden	12,833 27	14,143 28	15,345 72	15,588 93	17,173 46
Medford	12,636 70	13,926 64	15,110 66	15,345 22	16,910 40
Melrose	4,257 12	4,691 69	5,090 56	5,169 59	5,696 87
Newton	26,660 13	29,381 68	31,879 68	32,374 66	35,676 65
Quincy	6,791 89	7,485 24	8,121 62	8,247 69	9,088 94
Somerville	17,959 70	19,793 09	21,475 86	21,809 23	24,083 70
Waltham	6,900 35	7,604 75	8,251 29	8,379 38	9,234 06
Woburn	3,765 71	4,150 13	4,502 98	4,572 87	5,089 28
TOWNS					
Arlington	4,158 67	4,583 18	4,972 83	5,050 01	5,565 13
Belmont	2,229 44	2,457 02	2,665 90	2,707 29	2,985 44
Braintree	1,764 04	1,944 16	2,109 42	2,142 18	2,360 69
Brookline	31,185 94	34,369 45	37,291 45	37,870 31	41,732 98
Canton	2,157 02	2,377 20	2,579 31	2,619 35	2,886 52
Cohasset	327 65	412 65	440 43	468 43	477 54
Dedham	4,029 66	4,441 06	4,818 63	4,893 42	5,392 53
Dover	512 35	564 59	612 57	622 09	685 51
Hingham	1,691 46	1,864 14	2,022 61	2,054 01	2,263 50
Hull	2,162 33	2,383 10	2,585 70	2,625 85	2,893 67
Hyde Park	3,936 40	4,338 10	4,707 07	4,780 12	5,267 70
Milton	15,740 40	17,347 29	18,822 12	19,114 30	21,063 90
Nahant	3,765 70	4,150 14	4,502 98	4,572 87	5,089 27
Needham	1,194 71	1,316 65	1,428 58	1,450 77	1,598 76
Revere	7,117 61	7,844 19	8,511 09	8,643 20	9,524 80
Saugus	1,210 41	1,333 97	1,447 38	1,469 84	1,619 77
Stoneham	1,789 59	1,972 25	2,139 93	2,173 12	2,394 81
Swampscott	2,172 90	2,394 52	2,598 09	2,638 42	2,907 51
Wakefield	2,007 00	2,211 89	2,399 94	2,437 19	2,685 79
Watertown	4,758 86	5,244 66	5,690 54	5,778 90	6,368 32
Wellesley	2,922 71	3,221 11	3,494 95	3,549 22	3,911 19
Weston	2,498 24	2,753 24	2,987 32	3,033 69	3,343 11
Westwood	506 77	558 46	605 96	615 36	678 13
Weymouth	2,539 61	2,798 84	3,036 80	3,083 93	3,398 49
Winchester	5,271 11	5,809 23	6,303 12	6,400 97	7,053 84
Winthrop	2,482 72	2,736 14	2,968 78	3,014 84	3,322 36
Total	\$517,923 17	\$570,897 13	\$619,418 96	\$629,076 55	\$693,163 32

Metropolitan Sewerage Loans.

Issued.	Amount.	Rate.	Due.	Interest.	Premiums.
1. 1890	\$3,000,000	3%	1930	\$3,600,000	\$89,835.00
2. 1891	368,000	3	1930	480,560	35,130.80
3. 1892	1,053,000	3	1930	1,200,420	11,575.00
4. 1893	579,000	3	1930	646,690	1,760.00
5. 1894	500,000	3	1930	540,000	par
6. 1895	300,000	3	1930	315,000	par
7. 1895	300,000	3	1935	360,000	100.5 1,755.00
8. 1896	30,000	3	1930	30,600	par
9. 1896	200,000	3	1935	234,000	par
10. 1897	80,000	3½	1930	92,400	106.243 }
11. 1897	300,000	3½	1935	399,000	106.98 } 5,084.80
12. 1898	5,000	3	1930	4,800	par } 22,843.75
13. 1898	215,000	3½	1930	240,800	par } 4,088.00
14. 1898	35,000	3½	1935	45,325	par }
15. 1899	1,000,000	3	1939	1,200,000	100.64 6,400.00
16. 1899	25,000	3	1936	27,750	100.64 160.00
17. 1900	265,000	3	1930	238,500	103.948 }
18. 1900	10,000	3	1939	11,700	100.79 } 10,541.20
19. 1900	912		1939	1,067	par
20. 1901	2,000,000	3½	1940	2,780,000	106.71 134,200.00
21. 1901	40,000	3	1936	42,000	100.915 866.00
22. 1902	14,000	3	1939	15,540	par
23. 1902	650,000	3½	1940	864,500	107.243 47,074.25
	\$10,969,912			\$13,270,652	\$370,813.80
				370,813	
				\$12,899,839	
				10,969,912	
Principal and interest . . .				\$23,869,751	

Metropolitan Water Loans.

Issued.	Amount.	Rate.	Due.	Interest.	Premiums.
1. 1895	\$2,225,000	3½%	1935	\$3,115,000	110.67 \$237,407.50
2. 1896	2,775,000	3½	1935	6,517,875	110.67 }
3. 1896	2,000,000	3½	1935		105.829 } 412,672.50
4. 1897	6,000,000	3½	1935	7,980,000	107.82 487,924.60
5. 1898	2,000,000	3½	1938	5,600,000	113.176 }
6. 1898	2,000,000		1938		112.877 } 521,060.00
7. 1899	3,000,000	3	1939	3,600,000	100.64 19,200.00
8. 1900	1,000,000	3	1939	1,200,000	102.78 27,800.00
9. 1901	6,900,000	3	1941	8,280,000	} 274,872.50
10. 1901	3,100,000	3½	1941	4,340,000	
11. 1902	3,500,000	3½	1942	4,900,000	109.13 319,550.00
	\$34,500,000			\$45,532,875	\$2,300,487.10
				2,300,487	
				\$43,232,388	
				34,500,000	
Principal and interest . . .				\$77,732,388	

Interest on deposits not included in above.

Dec. 10, 1902.

**Cost of Metropolitan Park, Water, and Sewer Loans, Issued
Between 1890 and 1902, both Inclusive, Approximately
at \$56,000,000, for 40 Years at 3½% paying 1-40,
or \$1,400,000 Each Year.**

		Interest.	Principal and Interest.
1	\$56,000,000 at 3½% for 1 year 1,400,000	\$1,960,000	
			\$3,360,000
2	\$54,600,000 " " 1,400,000	1,911,000	
			3,311,000
3	\$53,200,000 " " 1,400,000	1,862,000	
			3,262,000
4	\$51,800,000 " " 1,400,000	1,813,000	
			3,213,000
5	\$50,400,000 " " 1,400,000	1,764,000	
			3,164,000
6	\$49,000,000 " " 1,400,000	1,715,000	
			3,115,000
7	\$47,600,000 " " 1,400,000	1,666,000	
			3,066,000
8	\$46,200,000 " " 1,400,000	1,617,000	
			3,017,000
9	\$44,800,000 " " 1,400,000	1,568,000	
			2,968,000
10	\$43,400,000 " " 1,400,000	1,519,000	
			2,919,000
11	\$42,000,000 " " 1,400,000	1,470,000	
			2,870,000
12	\$40,600,000 " " 1,400,000	1,421,000	
			2,821,000
13	\$39,200,000 " " 1,400,000	1,372,000	
			2,772,000
14	\$37,800,000 " " 1,400,000	1,323,000	
			2,723,000
15	\$36,400,000 " " 1,400,000	1,274,000	
			2,674,000
16	\$35,000,000 " " 1,400,000	1,225,000	
			2,625,000
17	\$33,600,000 " " 1,400,000	1,176,000	
			2,576,000
18	\$32,200,000 " " 1,400,000	1,127,000	
			2,527,000
19	\$30,800,000 " " 1,400,000	1,078,000	
			2,478,000

			Interest.	Principal and Interest.
	\$29,400,000 at 8½% for 1 year		\$1,029,000	
20	1,400,000			\$2,429,000
	\$28,000,000	" "	980,000	
21	1,400,000			2,880,000
	\$26,600,000	" "	931,000	
22	1,400,000			2,331,000
	\$25,200,000	" "	882,000	
23	1,400,000			2,282,000
	\$23,800,000	" "	833,000	
24	1,400,000			2,233,000
	\$22,400,000	" "	784,000	
25	1,400,000			2,184,000
	\$21,000,000	" "	735,000	
26	1,400,000			2,135,000
	\$19,600,000	" "	686,000	
27	1,400,000			2,086,000
	\$18,200,000	" "	637,000	
28	1,400,000			2,037,000
	\$16,800,000	" "	588,000	
29	1,400,000			1,988,000
	\$15,400,000	" "	539,000	
30	1,400,000			1,939,000
	\$14,000,000	" "	490,000	
31	1,400,000			1,890,000
	\$12,600,000	" "	441,000	
32	1,400,000			1,841,000
	\$11,200,000	" "	392,000	
33	1,400,000			1,792,000
	\$9,800,000	" "	343,000	
34	1,400,000			1,743,000
	\$8,400,000	" "	294,000	
35	1,400,000			1,694,000
	\$7,000,000	" "	245,000	
36	1,400,000			1,645,000
	\$5,600,000	" "	196,000	
37	1,400,000			1,596,000
	\$4,200,000	" "	147,000	
38	1,400,000			1,547,000
	\$2,800,000	" "	98,000	
39	1,400,000			\$1,498,000
	\$1,400,000	" "	\$49,000	
40	1,400,000			1,449,000
	0,600,000			
			\$40,180,000	\$96,180,000

**Metropolitan Park Payments for Brookline, Under Present
Apportionment.**

	Parks.	Boulevards.	Nantasket.	Total.
1905 Sinking Fund	\$6,955 55	\$1,875 63	\$569 69	
Interest	15,679 32	4,291 14	1,240 66	\$30,611 99
1906 Sinking Fund	6,955 55	1,875 63	569 69	
Interest	15,679 32	4,291 14	1,240 66	30,611 99
1907 Sinking Fund	6,955 55	1,875 63	569 69	
Interest	15,679 32	4,291 14	1,240 66	30,611 99
1908 Sinking Fund	6,955 55	1,875 63	569 69	
Interest	15,679 32	4,291 14	1,240 66	30,611 99
1909 Sinking Fund	6,955 55	1,875 63	569 69	
Interest	15,679 32	4,291 14	1,240 66	30,611 99
1910 Sinking Fund	6,955 55	1,875 63	569 69	
Interest	15,679 32	4,291 14	1,240 66	30,611 99
1911 Sinking Fund	6,955 55	1,875 63	569 69	
Interest	15,679 32	4,291 14	1,240 66	30,611 99
1912 Sinking Fund	6,955 55	1,875 63	569 69	
Interest	15,679 32	4,291 14	1,240 66	30,611 99
1913 Sinking Fund	6,955 55	1,875 63	569 69	
Interest	15,679 32	4,291 14	1,240 66	30,611 99
1914 Sinking Fund	6,955 55	1,875 63	569 69	
Interest	15,679 32	4,291 14	1,240 66	30,611 99
1915 Sinking Fund	6,955 55	1,875 63	569 69	
Interest	15,679 32	4,291 14	1,240 66	30,611 99
1916 Sinking Fund	6,955 55	1,875 63	569 69	
Interest	15,679 32	4,291 14	1,240 66	30,611 99
1917 Sinking Fund	6,955 55	1,875 63	569 69	
Interest	15,679 32	4,291 14	1,240 66	30,611 99
1918 Sinking Fund	6,955 55	1,875 63	569 69	
Interest	15,679 32	4,291 14	1,240 66	30,611 99
1919 Sinking Fund	6,955 55	1,875 63	569 69	
Interest	15,679 32	4,291 14	1,240 66	30,611 99
1920 Sinking Fund	6,955 55	1,875 63	569 69	
Interest	15,679 32	4,291 14	1,240 66	30,611 99
1921 Sinking Fund	6,955 55	1,875 63	569 69	
Interest	15,679 32	4,291 14	1,240 66	30,611 99
1922 Sinking Fund	6,955 55	1,875 63	569 69	
Interest	15,679 32	4,291 14	1,240 66	30,611 99
1923 Sinking Fund	6,955 55	1,875 63	569 69	
Interest	15,679 32	4,291 14	1,240 66	30,611 99
1924 Sinking Fund	6,955 55	1,875 63	569 69	
Interest	15,679 32	4,291 14	1,240 66	30,611 99
1925 Sinking Fund	6,955 55	1,875 63	569 69	
Interest	15,679 32	4,291 14	1,240 66	30,611 99
1926 Sinking Fund	6,955 55	1,875 63	569 69	
Interest	15,679 32	4,291 14	1,246 66	30,611 99
1927 Sinking Fund	6,955 55	1,875 63	569 69	
Interest	15,679 32	4,291 14	1,240 66	30,611 99
1928 Sinking Fund	6,955 55	1,875 63	569 69	
Interest	15,679 32	4,291 14	1,240 66	30,611 99
1929 Sinking Fund	6,955 55	1,875 63	569 69	
Interest	15,679 32	4,291 14	1,240 66	30,611 99
1930 Sinking Fund	6,955 55	1,875 63	569 69	
Interest	15,679 32	4,291 14	1,240 66	30,611 99
1931 Sinking Fund	6,955 55	1,875 69	569 69	
Interest	15,679 32	4,291 14	1,240 66	30,611 99
1932 Sinking Fund	6,955 55	1,875 63	569 69	
Interest	15,679 32	4,291 14	1,240 66	30,611 99
1933 Sinking Fund	6,955 55	1,875 63	569 69	
Interest	15,679 32	4,291 14	1,240 66	30,611 99

	Parks.	Boulevards.	Nantasket.	Totals.
1934 Sinking Fund	\$ 5,603 63	\$1,615 65	\$ 569 69	
Interest	12,936 12	3,763 60	1,240 66	\$25,729 35
1935 Sinking Fund	5,603 63	1,615 65	569 69	
Interest	12,936 12	3,763 60	1,240 66	25,729 35
1936 Sinking Fund	3,706 58	1,331 10	569 69	
Interest	8,715 82	3,130 56	1,240 66	18,694 41
1937 Sinking Fund	2,436 99	877 67	569 69	
Interest	5,761 61	2,075 48	1,240 66	12,962 10
1938 Sinking Fund	1,569 41	834 29	569 69	
Interest	3,651 46	1,969 98	1,240 66	9,835 49
1939 Sinking Fund	1,147 03	626 66	80 88	
Interest	2,738 07	1,517 80	177 24	6,287 68
1940 Sinking Fund	1,147 03	287 66	80 88	
Interest	2,738 07	749 10	177 24	5,179 98
1941 Sinking Fund	607 19	287 66		
Interest	1,562 42	749 10		3,206 37
1942 Sinking Fund	607 19	287 66		
Interest	1,562 42	749 10		3,206 37
1943 Sinking Fund	238 66	119 33		
Interest	633 05	616 52		1,607 56
	<u>\$732,313 73</u>	<u>\$205,804 50</u>	<u>\$62,068 14</u>	<u>\$1,000,186 37</u>

Brookline's proportion of the Metropolitan Parks, Boulevards and Nantasket debt is **\$625,957 50**

Parks.	Sinking Fund	\$224,378 29		
	Interest	507,935 44		
			\$732,313 73	
Boulevards.	Sinking Fund	\$62,276 50		
	Interest	143,527 90		
			205,804 50	
Nantasket.	Sinking Fund	\$19,531 22		
	Interest	42,536 92		
			62,068 14	
				\$1,000,186 37

(This table is from Brookline's Town Accountant.)

**Metropolitan Sewer Payments for Brookline, Under Present
Apportionment.**

	Sinking Fund.	Interest.	Total.
1905	\$9,129 59	\$45,880 99	\$54,960 58
1906	9,103 55	49,546 55	58,650 10
1907	9,103 55	49,546 55	58,650 10
1908	9,103 55	49,546 55	58,650 10
1909	9,680 60	49,546 55	59,227 15
1910	13,041 62	49,546 55	62,588 17
1911	13,041 62	49,546 55	62,588 17
1912	13,041 62	49,546 55	62,588 17
1913	13,721 15	49,546 55	63,267 70
1914	13,945 39	49,546 55	63,491 94
1915	16,133 17	49,546 45	65,679 72
1916	16,302 67	49,546 55	65,849 22
1917	16,302 67	49,546 55	65,849 22
1918	16,302 67	49,546 55	65,849 22
1919	18,975 25	49,546 55	68,521 80
1920	30,035 52	49,546 55	79,582 07
1921	30,035 52	49,546 55	79,582 07
1922	30,035 52	49,546 55	79,582 07
1923	32,632 70	49,546 55	82,179 25
1924	33,654 89	49,546 55	83,201 44
1925	35,447 57	49,546 55	84,994 12
1926	35,586 46	49,546 55	85,133 01
1927	35,586 46	49,546 55	85,133 01
1928	35,586 46	49,546 55	85,133 01
1929	37,776 38	49,546 55	87,322 93
1930	40,411 43	44,931 34	85,342 77
1931	40,411 43	44,931 34	85,342 77
1932	40,411 43	44,931 34	85,342 77
1933	42,539 57	44,931 34	87,470 91
1934	43,377 15	44,931 34	88,308 49
1935	38,104 97	39,765 20	77,870 17
1936	37,696 51	39,390 22	77,086 73
1937	37,696 51	39,390 22	77,086 73
1938	37,696 51	39,390 22	77,086 73
1939	31,256 08	33,477 50	64,733 58
1940	8,722 04	9,341 93	18,063 97
1941	8,722 04	9,341 93	18,063 97
1942	8,722 04	9,341 93	18,063 97
1943	2,463 28	2,688 35	5,101 63
	\$951,537 14	\$1,681,682 39	\$2,633,219 53

Brookline's proportion of the Metropolitan Sewer Dept., South System, is	\$1,481,269 98
Brookline's proportion of the Metropolitan Parks, Boulevards and Nantasket debt is	625,957 50
Total	\$2,107,227 48

(This table is from Brookline's Town Accountant.)

BROOKLINE.
Comparison of Payments under Sinking Fund and Serial Bond methods, made year by year
from 1905 to 1955.

<i>Annual cost to Brookline, as charged by the State, for Parks and Sewers—40-year Sinking Fund Bonds. Principal equal to \$2,107,227.48; as given by the Town Accountant.</i>		<i>Annual cost to Brookline of \$3,000,000 40-year Serial Bonds, payable 140th each year.</i>			<i>Annual cost to Brookline of \$3,000,000 50-year Serial Bonds, payable 140th each year.</i>		
		3%	3½%	3¾%	3%	3½%	3¾%
1	1905 { Parks \$30,611 99 Sewers 54,960 58	\$85,572 57					
2	1906 { Parks 30,611 99 Sewers 58,650 10	89,262 09	\$115,000	\$120,000	\$100,000	\$105,000	\$110,000
3	1907 { Parks 30,611 99 Sewers 58,650 10	89,262 09	113,375	118,250	98,809	103,700	108,600
4	1908 { Parks 30,611 99 Sewers 58,650 10	89,262 09	111,750	116,500	97,600	102,400	107,200
5	1909 { Parks 30,611 99 Sewers 59,227 15	89,839 14	110,125	114,750	96,400	101,100	105,800
6	1910 { Parks 30,611 99 Sewers 62,588 17	93,200 16	108,500	113,000	95,200	99,800	104,400
7	1911 { Parks 30,611 99 Sewers 62,588 17	93,200 16	106,875	111,250	94,000	98,500	103,000
8	1912 { Parks 30,611 99 Sewers 62,588 17	93,200 16	105,250	109,500	92,800	97,200	101,600
9	1913 { Parks 30,611 99 Sewers 63,267 70	93,879 69	103,625	107,750	91,600	95,900	100,200
10	1914 { Parks 30,611 99 Sewers 63,491 94	94,103 93	102,000	106,000	90,400	94,600	98,800
11	1915 { Parks 30,611 99 Sewers 65,679 72	96,291 71	100,375	104,250	89,200	93,800	97,400

<i>Annual cost to Brookline, as charged by the State, for Parks and Sewers.—40-year Sinking Fund Bonds. Principal equal to \$2,107,237.48; as given by the Town Accountant.</i>		<i>Annual cost to Brookline of \$2,000,000 40-year Serial Bonds, payable 1-40th each year.</i>			<i>Annual cost to Brookline of \$2,000,000 50-year Serial Bonds, payable 1-50th each year.</i>		
		3%	3 1/4%	3 1/2%	3%	3 1/4%	3 1/2%
12	1916 { Parks Sewers	30,611 99 65,849 22	96,461 21	102,500	88,000	92,000	96,000
13	1917 { Parks Sewers	30,611 99 65,849 22	96,461 21	100,750	86,800	90,700	94,600
14	2818 { Parks Sewers	30,611 99 65,849 22	96,461 21	99,000	85,600	89,400	93,200
15	1919 { Parks Sewers	30,611 99 68,521 80	99,133 79	97,250	84,400	88,100	91,800
16	1920 { Parks Sewers	30,611 99 79,582 07	110,194 06	95,500	83,200	86,800	90,400
17	1921 { Parks Sewers	30,611 99 79,582 07	110,194 06	93,750	82,000	85,500	89,000
18	1922 { Parks Sewers	30,611 99 79,582 07	110,194 06	92,000	80,800	84,200	87,600
19	1923 { Parks Sewers	30,611 99 82,179 25	112,791 24	90,250	79,600	82,900	86,200
20	1934 { Parks Sewers	30,611 99 83,201 44	113,813 43	88,500	78,400	81,600	84,800
21	1925 { Parks Sewers	30,611 99 84,994 12	115,606 11	86,750	77,200	80,300	83,400
22	1926 { Parks Sewers	30,611 99 85,133 01	115,745 00	85,000	76,000	79,000	82,000
23	1927 { Parks Sewers	30,611 99 85,133 01	115,745 00	83,250	74,800	77,700	80,600
24	1928 { Parks Sewers	30,611 99 85,133 01	115,745 00	81,500	73,600	76,400	79,200

<i>Annual cost to Brookline, as charged by the State, for Parks and Sewers,—40-year Sinking Fund Bonds. Principal equal to \$2,107,227.48; as given by the Town Accountant.</i>		<i>Annual cost to Brookline of \$2,000,000 40-year Serial Bonds, payable 1.40th each year.</i>			<i>Annual cost to Brookline of \$2,000,000 50-year Serial Bonds, payable 1.50th each year.</i>		
		3%	3 1/4 %	3 1/2 %	3%	3 1/4 %	3 1/2 %
25	1929 { Parks { Sewers	30,611 99 87,322 93	117,934 92				
26	1930 { Parks { Sewers	30,611 99 85,342 77	115,954 76		72,400	75,100	77,800
27	1931 { Parks { Sewers	30,611 99 85,342 88	115,954 76		71,200	73,800	76,400
28	1932 { Parks { Sewers	30,611 99 85,342 77	115,954 76		70,000	72,500	75,000
29	1933 { Parks { Sewers	30,611 99 87,470 91			68,800	71,200	73,600
30	1934 { Parks { Sewers	25,729 35 88,308 49	118,082 90		67,600	69,900	72,200
31	1935 { Parks { Sewers	25,729 35 77,870 17	114,037 84		66,400	68,600	70,800
32	1936 { Parks { Sewers	18,694 41 77,086 73	103,599 52		65,200	67,300	69,400
33	1937 { Parks { Sewers	12,962 10 77,086 73	95,781 14		64,000	66,000	68,000
34	1938 { Parks { Sewers	9,835 49 77,086 73	90,048 83		62,800	64,700	66,600
35	1939 { Parks { Sewers	6,287 68 64,783 58	86,922 22		61,600	63,400	65,200
36	1940 { Parks { Sewers	5,179 98 18,063 97	71,021 26		60,400	62,100	63,800
37	1941 { Parks { Sewers	3,206 37 18,063 97	23,243 95		59,200	60,800	62,400
			21,270 34		58,000	59,500	61,000

Annual cost to Brookline, as charged by the State, for Parks and Sewers—40-year Sinking Fund Bonds. Principal equal to \$2,107,227.43 as given by the Town Accountant.				Annual cost to Brookline of \$2,000,000 40-year Serial Bonds, payable 1-40th each year.				Annual cost to Brookline of \$2,000,000 50-year Serial Bonds, payable 1-50th each year.			
				3%	3 1/4%	3 1/2%		3%	3 1/4%	3 1/2%	
38	1942	{ Parks	3,206 37					56,800	58,200	59,600	
		{ Sewers	18,063 97	56,000	56,500	57,000					
39	1943	{ Parks	1,607 56					55,600	56,900	58,200	
		{ Sewers	5,101 63	54,500	54,875	55,250		54,400	55,600	56,800	
40	1944	.....	.....	53,000	53,250	53,500		53,200	54,300	55,400	
41	1945	.....	.....	51,500	51,625	51,750					
	Totals	.....	\$3,633,405 90	\$3,230,000	\$3,332,500	\$3,435,000					
	Savings by Serial Bonds	.....	403,405	403,405	300,905	198,405					
				\$3,633,405	\$3,633,405	\$3,633,405					
42	1946	.....	.....					52,000	53,000	54,000	
43	1947	.....	.....					50,800	51,700	52,600	
44	1948	.....	.....					49,600	50,400	51,200	
45	1949	.....	.....					48,400	49,100	49,800	
46	1950	.....	.....					47,200	47,800	48,400	
47	1951	.....	.....					46,000	46,500	47,000	
48	1952	.....	.....					44,800	45,200	45,600	
49	1953	.....	.....					43,600	43,900	44,200	
50	1954	.....	.....					42,400	42,600	42,800	
51	1955	.....	.....					41,200	41,300	41,400	
								\$3,530,000*	\$3,657,500	\$3,785,000†	

* Under the Sinking Fund method this total would be \$3,570,610 for the 50 years, on a 3 per cent. basis, or an excess of \$346,610 over the Serial Bond method.

† Under the Sinking Fund method this total would be \$4,253,816 for the 50 years, on a 3 1-2 per cent. basis, or an excess of \$468,816 over the Serial Bond method.

**Boston's Serial Bond Issue. \$850,000 for 50 Years, at 3%,
For the Suffolk County Court House. Issued under Acts
of 1885, Chap. 377, Sect. 5.**

			Interest.	Principal and Interest.
1	\$850,000 at 3% for 1 year 17,000		\$25,500	
				\$42,500
2	\$833,000 17,000	" "	24,990	
				41,990
3	\$816,000 17,000	" "	24,480	
				41,480
4	\$799,000 17,000	" "	23,970	
				40,970
5	\$782,000 17,000	" "	23,460	
				40,460
6	\$765,000 17,000	" "	22,950	
				39,950
7	\$748,000 17,000	" "	22,440	
				39,440
8	\$731,000 17,000	" "	21,930	
				38,930
9	\$714,000 17,000	" "	21,420	
				38,420
10	\$697,000 17,000	" "	20,910	
				37,910
11	\$680,000 17,000	" "	20,400	
				37,400
12	\$663,000 17,000	" "	19,890	
				36,890
13	\$646,000 17,000	" "	19,380	
				36,380
14	\$629,000 17,000	" "	18,870	
				35,870
15	\$612,000 17,000	" "	18,360	
				35,360
16	\$595,000 17,000	" "	17,850	
				34,850
17	\$578,000 17,000	" "	17,340	
				34,340
18	\$561,000 17,000	" "	16,830	
				33,830
19	\$544,000 17,000	" "	16,320	
				33,320
	\$527,000	" "	15,810	

			Interest.	Principal and Interest.
20	17,000			
	<u>\$510,000 at 3% for 1 year</u>		\$15,300	\$32,810
21	17,000			32,300
	<u>\$493,000</u>	" "	14,790	
22	17,000			31,790
	<u>\$476,000</u>	" "	14,280	
23	17,000			31,280
	<u>\$459,000</u>	" "	13,770	
24	17,000			30,770
	<u>\$442,000</u>	" "	13,260	
25	17,000			30,260
	<u>\$425,000</u>	" "	12,750	
26	17,000			29,750
	<u>\$408,000</u>	" "	12,240	
27	17,000			29,240
	<u>\$391,000</u>	" "	11,730	
28	17,000			28,730
	<u>\$374,000</u>	" "	11,220	
29	17,000			28,220
	<u>\$357,000</u>	" "	10,710	
30	17,000			27,710
	<u>\$340,000</u>	" "	10,200	
31	17,000			27,200
	<u>\$323,000</u>	" "	9,690	
32	17,000			26,690
	<u>\$306,000</u>	" "	9,180	
33	17,000			26,180
	<u>\$289,000</u>	" "	8,670	
34	17,000			25,670
	<u>\$272,000</u>	" "	8,160	
35	17,000			25,160
	<u>\$255,000</u>	" "	7,650	
36	17,000			24,650
	<u>\$238,000</u>	" "	7,140	
37	17,000			24,140
	<u>\$221,000</u>	" "	6,630	
38	17,000			23,630
	<u>\$204,000</u>	" "	6,120	
39	17,000			23,120
	<u>\$187,000</u>	" "	5,610	

			Interest.	Principal and Interest.
40	17,000			22,610
	<u>\$170,000</u>	at 3% for 1 year	\$5,100	
41	17,000			\$22,100
	<u>\$153,000</u>	" "	4,590	
42	17,000			21,590
	<u>\$136,000</u>	" "	4,080	
43	17,000			21,080
	<u>\$119,000</u>	" "	3,570	
44	17,000			20,570
	<u>\$102,000</u>	" "	3,060	
45	17,000			20,060
	<u>\$85,000</u>	" "	2,550	
46	17,000			19,550
	<u>\$68,000</u>	" "	2,040	
47	17,000			19,040
	<u>\$51,000</u>	" "	1,530	
48	17,000			18,530
	<u>\$34,000</u>	" "	1,020	
49	17,000			18,020
	<u>\$17,000</u>	" "	510	
50	17,000			17,510
	<u>00,000</u>			
			<u>\$650,250</u>	<u>\$1,500,250</u>

For tables showing the difference in interest, and the difference in the cost, in favor of this Serial Bond issue, see p. 26.

\$1,000,000 at 3% for 20 Years, 1-20 Payable Each Year.

	\$1,000,000 at 3% for 1 year			Interest. \$30,000	Principal and Interest.
1	<u>\$1,000,000</u> 50,000				\$80,000
2	<u>\$950,000</u> 50,000	"	"	28,500	78,500
3	<u>\$900,000</u> 50,000	"	"	27,000	77,000
4	<u>\$850,000</u> 50,000	"	"	25,500	75,500
5	<u>\$800,000</u> 50,000	"	"	24,000	74,000
6	<u>\$750,000</u> 50,000	"	"	22,500	72,500
7	<u>\$700,000</u> 50,000	"	"	21,000	71,000
8	<u>\$650,000</u> 50,000	"	"	19,500	69,500
9	<u>\$600,000</u> 50,000	"	"	18,000	68,000
10	<u>\$550,000</u> 50,000	"	"	16,500	66,500
11	<u>\$500,000</u> 50,000	"	"	15,000	65,000
12	<u>\$450,000</u> 50,000	"	"	13,500	63,500
13	<u>\$400,000</u> 50,000	"	"	12,000	62,000
14	<u>\$350,000</u> 50,000	"	"	10,500	60,500
15	<u>\$300,000</u> 50,000	"	"	9,000	59,000
16	<u>\$250,000</u> 50,000	"	"	7,500	57,500
17	<u>\$200,000</u> 50,000	"	"	6,000	56,000
18	<u>\$150,000</u> 50,000	"	"	4,500	54,500
19	<u>\$100,000</u> 50,000	"	"	3,000	53,000
20	<u>\$50,000</u> 50,000	"	"	1,500	51,500
	<u>00,000</u>				
				\$315,000	\$1,315,000

\$1,000,000 at 3% for 40 Years, 1-40 Payable Each Year.

			Interest.	Principal and Interest.
	\$1,000,000 at 3% for 1 year		\$30,000	
1	<u>25,000</u>			\$55,000
	<u>\$975,000</u>	" "	29,250	
2	<u>25,000</u>			54,250
	<u>\$950,000</u>	" "	28,500	
3	<u>25,000</u>			53,500
	<u>\$925,000</u>	" "	27,750	
4	<u>25,000</u>			52,750
	<u>\$900,000</u>	" "	27,000	
5	<u>25,000</u>			52,000
	<u>\$875,000</u>	" "	26,250	
6	<u>25,000</u>			51,250
	<u>\$850,000</u>	" "	25,500	
7	<u>25,000</u>			50,500
	<u>\$825,000</u>	" "	24,750	
8	<u>25,000</u>			49,750
	<u>\$800,000</u>	" "	24,000	
9	<u>25,000</u>			49,000
	<u>\$775,000</u>	" "	23,250	
10	<u>25,000</u>			48,250
	<u>\$750,000</u>	" "	22,500	
11	<u>25,000</u>			47,500
	<u>\$725,000</u>	" "	21,750	
12	<u>25,000</u>			46,750
	<u>\$700,000</u>	" "	21,000	
13	<u>25,000</u>			46,000
	<u>\$675,000</u>	" "	20,250	
14	<u>25,000</u>			45,250
	<u>\$650,000</u>	" "	19,500	
15	<u>25,000</u>			44,500
	<u>\$625,000</u>	" "	18,750	
16	<u>25,000</u>			43,750
	<u>\$600,000</u>	" "	18,000	
17	<u>25,000</u>			43,000
	<u>\$575,000</u>	" "	17,250	
18	<u>25,000</u>			42,250
	<u>\$550,000</u>	" "	16,500	
19	<u>25,000</u>			41,500
	<u>\$525,000</u>	" "	15,750	

			Interest.	Principal and Interest.
20	\$ 25,000			
	<u>\$500,000</u> at 3% for 1 year		\$15,000	\$40,750
21	25,000			
	<u>\$475,000</u> " "		14,250	40,000
22	25,000			
	<u>\$450,000</u> " "		13,500	39,250
23	25,000			
	<u>\$425,000</u> " "		12,750	38,500
24	25,000			
	<u>\$400,000</u> " "		12,000	37,750
25	25,000			
	<u>\$375,000</u> " "		11,250	37,000
26	25,000			
	<u>\$350,000</u> " "		10,500	36,250
27	25,000			
	<u>\$325,000</u> " "		9,750	35,500
28	25,000			
	<u>\$300,000</u> " "		9,000	34,750
29	25,000			
	<u>\$275,000</u> " "		8,250	34,000
30	25,000			
	<u>\$250,000</u> " "		7,500	33,250
31	25,000			
	<u>\$225,000</u> " "		6,750	32,500
32	25,000			
	<u>\$200,000</u> " "		6,000	31,750
33	25,000			
	<u>\$175,000</u> " "		5,250	31,000
34	25,000			
	<u>\$150,000</u> " "		4,500	30,250
35	25,000			
	<u>\$125,000</u> " "		3,750	29,500
36	25,000			
	<u>\$100,000</u> " "		3,000	28,750
37	25,000			
	<u>\$75,000</u> " "		2,250	28,000
38	25,000			
	<u>\$50,000</u> " "		1,500	27,250
39	25,000			
	<u>\$25,000</u> " "		750	26,500
40	25,000			
	<u>00.000</u>			25,750
			<u>\$615,000</u>	<u>\$1,615,000</u>

**\$1,000,000 at 3% for 50 Years, Paying 1-50th or \$20,000
Each Year.**

			Interest.	Principal and Interest.
	\$1,000,000 at 3% for 1 year		\$30,000	
1	<u>\$1,000,000</u> 20,000			\$50,000
	<u>\$980,000</u>	" "	29,400	
2	20,000			49,400
	<u>\$960,000</u>	" "	28,800	
3	20,000			48,800
	<u>\$940,000</u>	" "	28,200	
4	20,000			48,200
	<u>\$920,000</u>	" "	27,600	
5	20,000			47,600
	<u>\$900,000</u>	" "	27,000	
6	20,000			47,000
	<u>\$880,000</u>	" "	26,400	
7	20,000			46,400
	<u>\$860,000</u>	" "	25,800	
8	20,000			45,800
	<u>\$840,000</u>	" "	25,200	
9	20,000			45,200
	<u>\$820,000</u>	" "	24,600	
10	20,000			44,600
	<u>\$800,000</u>	" "	24,000	
11	20,000			44,000
	<u>\$780,000</u>	" "	23,400	
12	20,000			43,400
	<u>\$760,000</u>	" "	22,800	
13	20,000			42,800
	<u>\$740,000</u>	" "	22,200	
14	20,000			42,200
	<u>\$720,000</u>	" "	21,600	
15	20,000			41,600
	<u>\$700,000</u>	" "	21,000	
16	20,000			41,000
	<u>\$680,000</u>	" "	20,400	
17	20,000			40,400
	<u>\$660,000</u>	" "	19,800	
18	20,000			39,800
	<u>\$640,000</u>	" "	19,200	
19	20,000			39,200
	<u>\$620,000</u>	" "	18,600	

			Interest.	Principal and Interest.
20	20,000			
	<u>\$600,000</u>	at 3% for 1 year	\$18,000	\$38,600
21	20,000			
	<u>\$580,000</u>	" "	17,400	38,000
22	20,000			
	<u>\$560,000</u>	" "	16,800	37,400
23	20,000			
	<u>\$540,000</u>	" "	16,200	36,800
24	20,000			
	<u>\$520,000</u>	" "	15,600	36,200
25	20,000			
	<u>\$500,000</u>	" "	15,000	35,600
26	20,000			
	<u>\$480,000</u>	" "	14,400	35,000
27	20,000			
	<u>\$460,000</u>	" "	13,800	34,400
28	20,000			
	<u>\$440,000</u>	" "	13,200	33,800
29	20,000			
	<u>\$420,000</u>	" "	12,600	33,200
30	20,000			
	<u>\$400,000</u>	" "	12,000	32,600
31	20,000			
	<u>\$380,000</u>	" "	11,400	32,000
32	20,000			
	<u>\$360,000</u>	" "	10,800	31,400
33	20,000			
	<u>\$340,000</u>	" "	10,200	30,800
34	20,000			
	<u>\$320,000</u>	" "	9,600	30,200
35	20,000			
	<u>\$300,000</u>	" "	9,000	29,600
36	20,000			
	<u>\$280,000</u>	" "	8,400	29,000
37	20,000			
	<u>\$260,000</u>	" "	7,800	28,400
38	20,000			
	<u>\$240,000</u>	" "	7,200	27,800
39	20,000			
	<u>\$220,000</u>	" "	6,600	27,200

			Interest.	Principal and Interest.
40	\$20,000			
	<u>\$200,000 at 3% for 1 year</u>		\$6,000	\$26,600
41	20,000			26,000
	<u>\$180,000</u>	" "	5,400	
42	20,000			25,400
	<u>\$160,000</u>	" "	4,800	
43	20,000			24,800
	<u>\$140,000</u>	" "	4,200	
44	20,000			24,200
	<u>\$120,000</u>	" "	3,600	
45	20,000			23,600
	<u>\$100,000</u>	" "	3,000	
46	20,000			23,000
	<u>\$80,000</u>	" "	2,400	
47	20,000			22,400
	<u>\$60,000</u>	" "	1,800	
48	20,000			21,800
	<u>\$40,000</u>	" "	1,200	
49	20,000			21,200
	<u>\$20,000</u>	" "	600	
50	20,000			20,600
	<u>00,000</u>			
			<u>\$765,000</u>	<u>\$1,765,000</u>

\$1,000,000 for 20 Years, at 4%, Paying \$50,000 Yearly.

			Interest.	Principal and Interest.
	\$1,000,000 at 4% for 1 year		\$40,000	
1	<u>50,000</u>			\$90,000
2	<u>\$950,000</u> 50,000	" "	38,000	88,000
3	<u>\$900,000</u> 50,000	" "	36,000	86,000
4	<u>\$850,000</u> 50,000	" "	34,000	84,000
5	<u>\$800,000</u> 50,000	" "	32,000	82,000
6	<u>\$750,000</u> 50,000	" "	30,000	80,000
7	<u>\$700,000</u> 50,000	" "	28,000	78,000
8	<u>\$650,000</u> 50,000	" "	26,000	76,000
9	<u>\$600,000</u> 50,000	" "	24,000	74,000
10	<u>\$550,000</u> 50,000	" "	22,000	72,000
11	<u>\$500,000</u> 50,000	" "	20,000	70,000
12	<u>\$450,000</u> 50,000	" "	18,000	68,000
13	<u>\$400,000</u> 50,000	" "	16,000	66,000
14	<u>\$350,000</u> 50,000	" "	14,000	64,000
15	<u>\$300,000</u> 50,000	" "	12,000	62,000
16	<u>\$250,000</u> 50,000	" "	10,000	60,000
17	<u>\$200,000</u> 50,000	" "	8,000	58,000
18	<u>\$150,000</u> 50,000	" "	6,000	56,000
19	<u>\$100,000</u> 50,000	" "	4,000	54,000
20	<u>\$50,000</u> 50,000	" "	2,000	52,000
	<u>00,000</u>		\$420,000	\$1,420,000

1,000,000 for 40 Years, at 4%, Paying \$25,000 Yearly.

			Interest.	Principal and Interest.
	\$1,000,000 at 4% for 1 year		\$40,000	
1	<u>25,000</u>			\$65,000
	\$975,000	" "	39,000	
2	<u>25,000</u>			64,000
	\$950,000	" "	38,000	
3	<u>25,000</u>			63,000
	\$925,000	" "	37,000	
4	<u>25,000</u>			62,000
	\$900,000	" "	36,000	
5	<u>25,000</u>			61,000
	\$875,000	" "	35,000	
6	<u>25,000</u>			60,000
	\$850,000	" "	34,000	
7	<u>25,000</u>			59,000
	\$825,000	" "	33,000	
8	<u>25,000</u>			58,000
	\$800,000	" "	32,000	
9	<u>25,000</u>			57,000
	\$775,000	" "	31,000	
10	<u>25,000</u>			56,000
	\$750,000	" "	30,000	
11	<u>25,000</u>			55,000
	\$725,000	" "	29,000	
12	<u>25,000</u>			54,000
	\$700,000	" "	28,000	
13	<u>25,000</u>			53,000
	\$675,000	" "	27,000	
14	<u>25,000</u>			52,000
	\$650,000	" "	26,000	
15	<u>25,000</u>			51,000
	\$625,000	" "	25,000	
16	<u>25,000</u>			50,000
	\$600,000	" "	24,000	
17	<u>25,000</u>			49,000
	\$575,000	" "	23,000	
18	<u>25,000</u>			48,000
	\$550,000	" "	22,000	
19	<u>25,000</u>			47,000
	\$525,000	" "	21,000	

			Interest.	Principal and Interest.
20	\$25,000			
	<u>\$500,000 at 4% for 1 year</u>		\$20,000	\$46,000
21	25,000			
	<u>\$475,000</u>	" "	19,000	45,000
22	25,000			
	<u>\$450,000</u>	" "	18,000	44,000
23	25,000			
	<u>\$425,000</u>	" "	17,000	43,000
24	25,000			
	<u>\$400,000</u>	" "	16,000	42,000
25	25,000			
	<u>\$375,000</u>	" "	15,000	41,000
26	25,000			
	<u>\$350,000</u>	" "	14,000	40,000
27	25,000			
	<u>\$325,000</u>	" "	13,000	39,000
28	25,000			
	<u>\$300,000</u>	" "	12,000	38,000
29	25,000			
	<u>\$275,000</u>	" "	11,000	37,000
30	25,000			
	<u>\$250,000</u>	" "	10,000	36,000
31	25,000			
	<u>\$225,000</u>	" "	9,000	35,000
32	25,000			
	<u>\$200,000</u>	" "	8,000	34,000
33	25,000			
	<u>\$175,000</u>	" "	7,000	33,000
34	25,000			
	<u>\$150,000</u>	" "	6,000	32,000
35	25,000			
	<u>\$125,000</u>	" "	5,000	31,000
36	25,000			
	<u>\$100,000</u>	" "	4,000	30,000
37	25,000			
	<u>\$75,000</u>	" "	3,000	29,000
38	25,000			
	<u>\$50,000</u>	" "	2,000	28,000
39	25,000			
	<u>\$25,000</u>	" "	1,000	27,000
40	25,000			
	<u>00,000</u>			26,000
			<u>\$820,000</u>	<u>\$1,820,000</u>

**\$1,000,000 at 4% for 50 Years, Paying 1-50 or \$20,000
Each Year.**

	\$1,000,000 at 4% for 1 year	Interest.	Principal and Interest.
	\$40,000		
1	<u>\$1,000,000</u> 20,000		\$60,000
2	<u>\$980,000</u> 20,000	39,200	59,200
3	<u>\$960,000</u> 20,000	38,400	58,400
4	<u>\$940,000</u> 20,000	37,600	57,600
5	<u>\$920,000</u> 20,000	36,800	56,800
6	<u>\$900,000</u> 20,000	36,000	56,000
7	<u>\$880,000</u> 20,000	35,200	55,200
8	<u>\$860,000</u> 20,000	34,400	54,400
9	<u>\$840,000</u> 20,000	33,600	53,600
10	<u>\$820,000</u> 20,000	32,800	52,800
11	<u>\$800,000</u> 20,000	32,000	52,000
12	<u>\$780,000</u> 20,000	31,200	51,200
13	<u>\$760,000</u> 20,000	30,400	50,400
14	<u>\$740,000</u> 20,000	29,600	49,600
15	<u>\$720,000</u> 20,000	28,800	48,800
16	<u>\$700,000</u> 20,000	28,000	48,000
17	<u>\$680,000</u> 20,000	27,200	47,200
18	<u>\$660,000</u> 20,000	26,400	46,400
19	<u>\$640,000</u> 20,000	25,600	45,600
	<u>\$620,000</u>	24,800	

			Interest.	Principal and Interest.
20	\$20,000			\$44,800
21	\$600,000 at 4% for 1 year 20,000		\$24,000	44,000
22	\$580,000 20,000	" "	23,200	43,200
23	\$560,000 20,000	" "	22,400	42,400
24	\$540,000 20,000	" "	21,600	41,600
25	\$520,000 20,000	" "	20,800	40,800
26	\$500,000 20,000	" "	20,000	40,000
27	\$480,000 20,000	" "	19,200	39,200
28	\$460,000 20,000	" "	18,400	38,400
29	\$440,000 20,000	" "	17,600	37,600
30	\$420,000 20,000	" "	16,800	36,800
31	\$400,000 20,000	" "	16,000	36,000
32	\$380,000 20,000	" "	15,200	35,200
33	\$360,000 20,000	" "	14,400	34,400
34	\$340,000 20,000	" "	13,600	33,600
35	\$320,000 20,000	" "	12,800	32,800
36	\$300,000 20,000	" "	12,000	32,000
37	\$280,000 20,000	" "	11,200	31,200
38	\$260,000 20,000	" "	10,400	30,400
39	\$240,000 20,000	" "	9,600	29,600
	\$220,000	" "	8,800	

			Interest.	Principal and Interest.
40	20,000			
	<u>\$200,000 at 4% for 1 year</u>			28,800
41	20,000		8,000	
	<u>\$180,000</u>	" "		28,000
42	20,000		7,200	
	<u>\$160,000</u>	" "		27,200
43	20,000		6,400	
	<u>\$140,000</u>	" "		26,400
44	20,000		5,600	
	<u>\$120,000</u>	" "		25,600
45	20,000		4,800	
	<u>\$100,000</u>	" "		24,800
46	20,000		4,000	
	<u>\$80,000</u>	" "		24,000
47	20,000		3,200	
	<u>\$60,000</u>	" "		23,200
48	20,000		2,400	
	<u>\$40,000</u>	" "		22,400
49	20,000		1,600	
	<u>\$20,000</u>	" "		21,600
50	20,000		800	
	<u>00,000</u>			20,800
			<u>\$1,020,000</u>	<u>\$2,020,000</u>

\$1,000,000 at 3% for 20 years. Comparison Between Sinking Fund and Serial Bond Methods.*

By the Sinking Fund method the interest at 3% is . . .	\$600,000
“ “ Serial Bond “ “ “ “ . . .	315,000 ⁰⁰
Difference in <i>interest</i> in favor of Serial Bonds . . .	<u>\$285,000</u>
<hr/>	
\$1,000,000 Sinking Fund requirements for 20 years, on a 3% basis, the decimal for \$1 being .038654 . . .	\$734,426
\$1,000,000 at 3% for 20 years, interest . . .	600,000
Cost of loan, Sinking Fund method . . .	<u>\$1,334,426</u>
\$1,000,000 20 year Serial Bond, 1-20, or \$50,000, payable yearly . . .	\$1,000,000
Interest (annually diminishing) total at 3% . . .	315,000
Cost of loan, Serial Bond method . . .	<u>\$1,315,000</u>
Difference in <i>cost</i> in favor of Serial Bond method . . .	<u>\$19,426</u>

\$1,000,000 at 3% for 40 Years. Comparison between Sinking Fund and Serial Bond Methods.

By the Sinking Fund method the interest at 3% is . . .	\$1,200,000
“ “ Serial Bond “ “ “ “ . . .	615,000
Difference in <i>interest</i> in favor of Serial Bonds . . .	<u>\$585,000</u>
<hr/>	
\$1,000,000 Sinking Fund requirements for 40 years, on a 3% basis, the decimal for \$1 being .013441 . . .	\$524,199
\$1,000,000 at 3% for 40 years, interest . . .	1,200,000
Cost of loan, Sinking Fund method . . .	<u>\$1,724,199</u>
\$1,000,000 40 year Serial Bond, 1-40, or \$25,000, payable yearly . . .	\$1,000,000
Interest (annually diminishing) total at 3% . . .	615,000
Cost of loan, Serial Bond method . . .	<u>1,615,000</u>
Difference in <i>cost</i> in favor of Serial Bond method . . .	<u>\$109,199</u>
<hr/>	
\$1,000,000 Sinking Fund requirements for 40 years, on a 3½ % basis, the decimal for \$1 being .011969 . . .	\$466,791
\$1,000,000 at 3% for 40 years, interest . . .	1,200,000
Cost of loan, Sinking Fund method . . .	<u>1,666,791</u>
“ “ Serial Bond “ “ “ “ . . .	1,615,000
Difference in <i>cost</i> in favor of Serial Bond method . . .	<u>\$51,791</u>

* For summary of this and of the following five examples see p. 78.

\$1,000,000 at 3%, for 50 Years. Comparison Between Sinking Fund and Serial Bond Methods.

By the Sinking Fund method the interest at 3% is . . .	\$1,500,000
“ Serial Bond “ “ “ . . .	765,000
Difference in <i>interest</i> in favor of Serial Bonds . . .	\$735,000

\$1,000,000 Sinking Fund requirements for 50 years, on a 3% basis, the decimal for \$1 being .008945 . . .	\$438,305
\$1,000,000 at 3% for 50 years, interest . . .	1,500,000
Cost of loan, Sinking Fund method . . .	\$1,938,305
\$1,000,000 50 year Serial Bonds, 1-50, or \$20,000, payable yearly . . .	\$1,000,000
Interest (annually diminishing) total at 3% . . .	765,000
Cost of loan, Serial Bond method . . .	\$1,765,000
Difference in <i>cost</i> in favor of Serial Bond method . . .	\$173,305

\$1,000,000 Sinking Fund requirements for 50 years, on a 3½% basis, the decimal for \$1 being .007692 . . .	\$376,908
\$1,000,000 at 3% for 50 years, interest . . .	1,500,000
Cost of loan, Sinking Fund method . . .	\$1,876,908
“ “ Serial Bond “ “ . . .	1,765,000
Difference in <i>cost</i> in favor of Serial Bond method . . .	\$111,908

\$1,000,000 Sinking Fund requirements for 50 years, on a 4% basis, the decimal for \$1 being .006593 . . .	\$323,057
\$1,000,000 at 3% for 50 years, interest . . .	1,500,000
Cost of loan, Sinking Fund method . . .	\$1,823,057
“ “ Serial Bond “ “ . . .	1,765,000
Difference in <i>cost</i> in favor of Serial Bond method . . .	\$58,057

\$1,000,000 at 4% for 20 Years. Comparison between Sinking Fund and Serial Bond Methods.

By the Sinking Fund method the interest at 4% is . . .	\$800,000
“ “ Serial Bond “ “ “ “ . . .	420,000
Difference in <i>interest</i> in favor of Serial Bonds . . .	\$380,000

\$1,000,000 Sinking Fund requirements for 20 years, on a 3% basis, the decimal for \$1 being .038654 . . .	\$734,426
\$1,000,000 at 4% for 20 years, interest . . .	800,000
Cost of loan, Sinking Fund method . . .	\$1,534,426
\$1,000,000 20 year Serial Bond, 1-20, or \$50,000, payable yearly . . .	\$1,000,000
Interest (annually diminishing) total at 4% . . .	420,000
Cost of loan, Serial Bond method . . .	1,420,000
Difference in <i>cost</i> in favor of Serial Bond method . . .	\$114,426

\$1,000,000 Sinking Fund requirements for 20 years, on a 3½% basis, the decimal for \$1 being .036657 . . .	\$696,483
\$1,000,000 at 4% for 20 years, interest . . .	800,000
Cost of loan, Sinking Fund method . . .	\$1,496,483
“ “ Serial Bond “ “ “ “ . . .	1,420,000
Difference in <i>cost</i> in favor of Serial Bond method . . .	\$76,483

\$1,000,000, Sinking Fund requirements for 20 years, on a 4% basis, the decimal for \$1 being .034749 . . .	\$660,231
\$1,000,000 at 4% for 20 years, interest . . .	800,000
Cost of loan, Sinking Fund method . . .	\$1,460,231
“ “ Serial Bond “ “ “ “ . . .	1,420,000
Difference in <i>cost</i> in favor of Serial Bond method . . .	\$40,231

**\$1,000,000 at 4 % for 40 Years. Comparison Between Sinking
Fund and Serial Bond Methods.**

By the Sinking Fund method the interest at 4 % is . . .	\$1,600,000
" Serial Bond " " " . . .	820,000
Difference in <i>interest</i> in favor of Serial Bonds . . .	<u>\$780,000</u>

\$1,000,000 Sinking Fund requirements for 40 years, on a 3 % basis, the decimal for \$1 being .013441 . . .	\$ 524,199
\$1,000,000 at 4 % for 40 years, interest . . .	<u>1,600,000</u>
Cost of loan, Sinking Fund method . . .	\$2,124,199
\$1,000,000 40 year Serial Bonds, 1-40, or \$25,000, payable yearly . . .	\$1,000,000
Interest (annually diminishing) total at 4 % . . .	<u>820,000</u>
Cost of loan, Serial Bond method . . .	<u>\$1,820,000</u>
Difference in <i>cost</i> in favor of Serial Bond method . . .	<u>\$304,199</u>

\$1,000,000 Sinking Fund requirements for 40 years, on a 3½ % basis, the decimal for \$1 being .011969 . . .	\$ 466,791
\$1,000,000 at 4 % for 40 years, interest . . .	<u>1,600,000</u>
Cost of loan, Sinking Fund method . . .	\$2,066,791
" " Serial Bond " " " . . .	<u>1,820,000</u>
Difference in <i>cost</i> in favor of Serial Bond method . . .	<u>\$246,791</u>

\$1,000,000. Sinking Fund requirements for 40 years, on a 4 % basis, the decimal for \$1 being .010635 . . .	\$ 414,765
\$1,000,000 at 4 % for 40 years, interest . . .	<u>1,600,000</u>
Cost of loan, Sinking Fund method . . .	\$2,014,765
" " Serial Bond " " " . . .	<u>1,820,000</u>
Difference in <i>cost</i> in favor of Serial Bond method . . .	<u>\$194,765</u>

\$1,000,000 at 4% for 50 Years. Comparison between Sinking Fund and Serial Bond Methods.

By the Sinking Fund method the interest at 4% is . . .	\$2,000,000
" " Serial Bond " " " " " " . . .	1,020,000
Difference in interest in favor of Serial Bonds . . .	<u>\$980,000</u>

\$1,000,000 Sinking Fund requirements for 50 years, on a 3% basis, the decimal for \$1 being .008945 . . .	\$488,305
\$1,000,000 at 4% for 50 years, interest . . .	<u>2,000,000</u>
Cost of loan, Sinking Fund method . . .	\$2,488,305
\$1,000,000 50 year Serial Bonds, 1-50, or \$20,000, payable yearly . . .	\$1,000,000
Interest (annually diminishing) total at 4% . . .	<u>1,020,000</u>
Cost of loan, Serial Bond method . . .	<u>\$2,020,000</u>
Difference in cost in favor of Serial Bond method . . .	<u>\$418,305</u>

\$1,000,000 Sinking Fund requirements for 50 years, on a 3½% basis, the decimal for \$1 being .007692 . . .	\$376,908
\$1,000,000 at 4% for 50 years, interest . . .	<u>2,000,000</u>
Cost of loan, Sinking Fund method . . .	\$2,376,908
" " Serial Bond " " " " " " . . .	<u>2,020,000</u>
Difference in cost in favor of Serial Bond method . . .	<u>\$356,908</u>

\$1,000,000 Sinking Fund requirements for 50 years, on a 4% basis, the decimal for \$1 being .006593 . . .	\$323,057
\$1,000,000 at 4% for 50 years, interest . . .	<u>2,000,000</u>
Cost of loan, Sinking Fund method . . .	\$2,323,057
" " Serial Bond " " " " " " . . .	<u>2,020,000</u>
Difference in cost in favor of Serial Bond method . . .	<u>\$303,057</u>

SUMMARY OF PRECEDING SIX EXAMPLES ON PAGES 73 TO 77.

\$1,000,000 at 3 per cent.		DIFFERENCE IN INTEREST IN FAVOR OF SERIAL BONDS.			\$1,000,000 at 4 per cent.		
		20 Years.	40 Years.	50 Years.	20 Years.	40 Years.	50 Years.
		\$285,000	\$585,000	\$735,000	\$380,000	\$780,000	\$980,000
		DIFFERENCE IN COST IN FAVOR OF SERIAL BONDS.			DIFFERENCE IN COST IN FAVOR OF SERIAL BONDS.		
Sinking Fund.		20 Years.*	40 Years.†	50 Years.‡	20 Years.*	40 Years.†	50 Years.‡
On 3 per cent. basis	. . .	\$19,426	\$109,199	\$173,305	\$114,426	\$304,199	\$418,305
" 3½ "	. . .	. . .	51,791	111,908	76,483	246,791	356,908
" 4 "	. . .	. . .	. . .	58,057	40,231	194,765	303,057

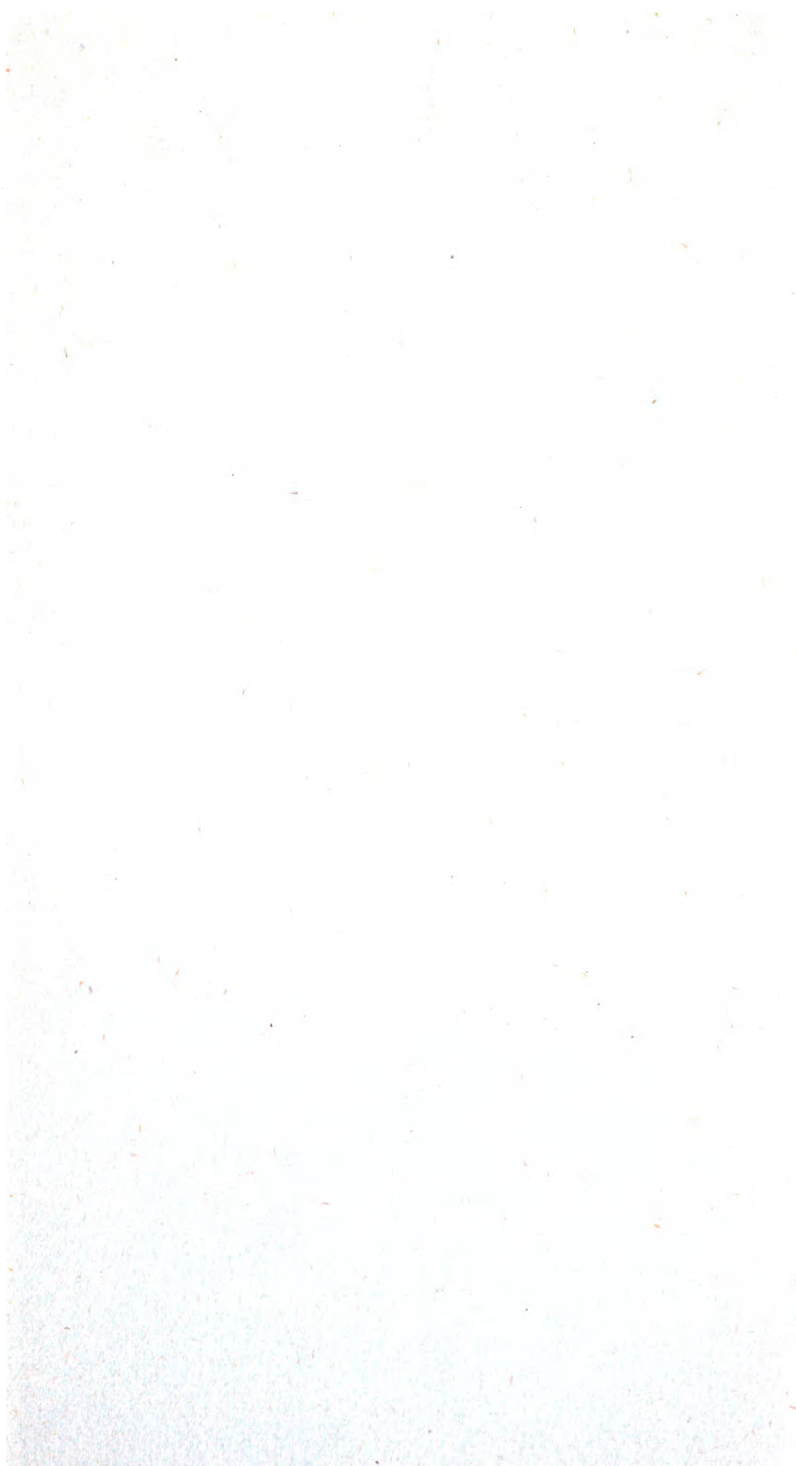
* Decimal for 19 years, and 19 payments.

† Decimal for 39 years, and 39 payments.

‡ Decimal for 49 years, and 49 payments.

If the number of payments were to equal the full number of years, there would be an increase over the above in the saving in favor of Serial Bonds, the ratio of such increase being larger with the Bonds of a shorter term.

If both the decimal taken and the number of payments made each equal the full number of years, there will still be a large gain in favor of the Serial Bonds.



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